Arid Lands
Initiative

The Arid Lands Initiative

Shared Priorities for Conservation at a Landscape Scale

Prepared by

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EXECUTIVE SUMMARY

Eastern Washington's arid lands are a diverse and productive landscape, with an intricate mix of shrub steppe, grasslands, wheat fields, irrigated crops, orchards and vineyards, wetlands, streams and lakes, and rocky outcrops and cliffs. This landscape supports over 235 plant and wildlife species, while producing billions of dollars in crops and livestock annually. To conserve this landscape and the biological, social and economic values it supports major challenges must be overcome, including those posed by the patchwork of land uses, and the equally fragmented and complex ownership patterns in this region. Successfully conserving a functioning landscape that supports healthy ecological systems and working lands therefore requires (a) action by multiple stakeholders across the ecoregion, and (b) sharing resources and coordinating these actions to achieve shared goals across this landscape.

Arid Lands Initiative Core Team

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USDI Bureau of Land Management – Karen Kelleher, Chris Sheridan

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Multiple state, federal and private entities are already taking conservation actions in many locations across eastern Washington's arid lands. To address the challenges posed by landscape conservation in eastern Washington, a group of interested entities came together to form the **Arid Lands Initiative** (ALI) in 2009. The ALI core team began by articulating a **shared vision** for conserving a whole, functioning landscape across eastern Washington, which would support biological and socio-economic values. With the help of experts and stakeholders, we assessed the health of the ecosystems and species that characterize eastern Washington's arid lands, and found a clear picture that encourages action across this landscape. Although these systems and species have undergone varying degrees of degradation, compromising their ability to provide wildlife habitat and economic goods and services, their recovery and restoration is still achievable.

The ALI core team, through a number of facilitated discussions, has identified the key components of a coordinated strategy to achieve the ALI's shared vision. These foundational strategy components are:

- **Shared biological priorities** that capture what we are striving to conserve. We selected eight focal systems and species whose successful conservation is the foundation for achieving our shared vision;
- **Shared strategic priorities** that articulate what actions are necessary to conserve these focal systems and species, and whose coordination at a landscape scale is critical for achieving our shared vision; and
- **Shared spatial priorities**, which represent the areas where these actions need to be implemented first, in order to conserve those systems and species in ways that add up at the landscape scale.

Arid Lands Initiative Shared Vision

The Washington Arid Lands Initiative represents a diverse assemblage of public, private and tribal interests working together to conserve and restore a viable, well connected system of eastern Washington's arid lands and related freshwater habitats, sustaining native plant and animal communities, and supporting compatible local economies and communities.

Shared Biological Priorities

Matrix systems

Shrub Steppe and Dry Grasslands – This focal system includes the majority of the uplands across the ecoregion, including shrublands, shrub steppe, scablands, and grasslands.

Riverine Systems – This focal system includes all courses of running water – whether permanent or seasonal – their stream channels, floodplains and the riparian and wetland vegetation they support.

Depressional Wetlands – These systems are distinguishable from the riverine systems in that the source of water is local, and remains contained in the lake or wetland. They include wetlands that contain open water for most of the year, or those with water only for a short season.

Fine-scale systems – these systems occur in patches within the matrix systems described above

Dunes – This focal system is characterized by sandy soils, and includes active dune systems where sands are being shifted by wind, to stabilized dunes covered in shrubland, shrub steppe, grassland and even woodland vegetation.

Transitional Woodlands – This focal system occurs mostly along the outer edges of the Columbia Plateau ecoregion, and is characterized by the presence of trees in upland areas.

Cliffs, Talus and Caves – This system is characterized by its landforms, including steep cliff faces, narrow canyons, unstable scree and talus slopes below cliffs, and smaller rock outcrops.

Species of additional concern – for whom conserving the systems they depend on is not enough

Grouse - The two grouse species in the Columbia Plateau – Greater Sage-grouse and Sharp-tailed Grouse – have specific needs to persist in this landscape that go beyond quality habitat, which is why we singled them out as focal species.

Burrowing Animals – Another suite of species we singled out are those that have specific soil requirements in which to burrow, requirements similar to those of agriculturally productive soils. The most representative of these species are the Washington ground squirrel and the Townsend's ground squirrel.

These shared priorities are meant to define specifically where the Arid Lands Initiative needs to invest to leverage each partner's actions towards achieving the viable, well-connected system of arid lands and related freshwater habitats we envision. They also provide the foundation for engaging new partners with interests in implementing land use, land management and land conservation actions in key areas. Coordinating these actions across this arid landscape will result in these efforts contributing to meeting both local and landscape-scale objectives, thereby supporting habitats and species and the communities and livelihoods that depend on them across the whole region.

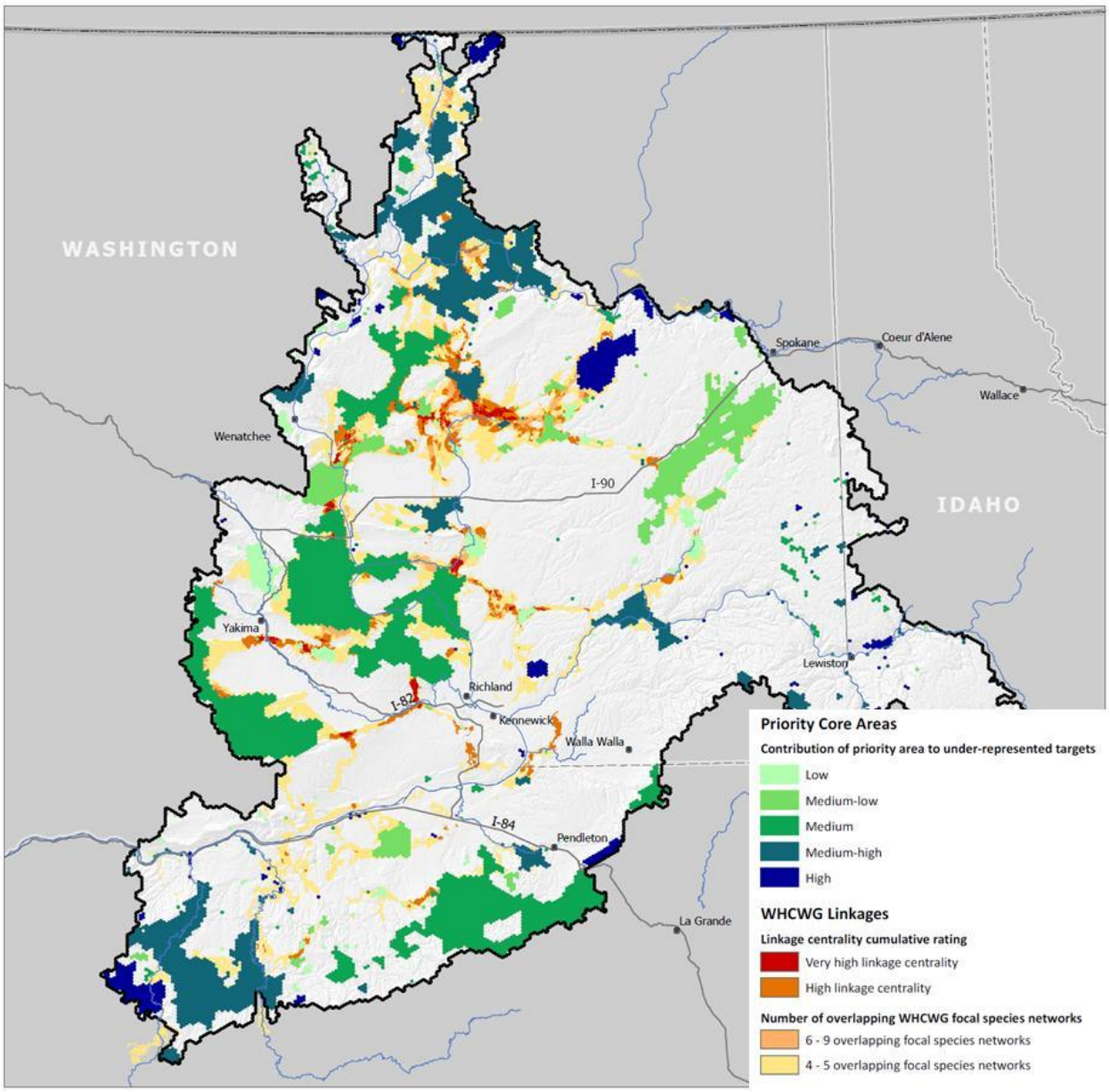
Shared Strategic Priorities

- **Protection**: Identify and protect priority lands through long-term techniques, such as conservation easements, land acquisition or other voluntary landowner incentives.
- **Restoration**: Improve or develop restoration approaches so that restoration projects are ecologically successful and economically viable.
- **Development**: Work with local governments to improve local Critical Area Ordinance (CAO) policies and development regulations.
- **Energy Development**: Minimize and mitigate for deleterious impact on conservation targets and priority areas by energy developments and related operations.
- **Agriculture**: Focus public funding and develop markets to reward maintenance and enhancement of environmental benefits on working lands in our arid environments.
- **Grazing**: Encourage the development and utilization of sustainable grazing practices.

Shared Priority Areas

The ALI core team agreed that our coordinated actions should focus first on:

- core patches (in greens and blues), with special emphasis on those patches where priority systems and species that are not well represented in currently protected areas in the Columbia Plateau are relatively abundant; and
- linkages between these core patches (fire colors), particularly those linkages that are critical for keeping the whole ecoregional network connected for multiple species.



Arid Lands Initiative's Shared Priority Areas. The ALI Core Team agreed on the spatial priorities shown in this map. These priority areas were developed based on two scientific analyses developed specifically for the Columbia Plateau ecoregion, with the ALI core team's input and interpretation. These analyses are: *The Spatial Conservation Priorities in the Columbia Plateau Ecoregion – Methods and data used to identify collaborative conservation priority areas for the Arid Lands Initiative*, completed by the Arid Lands Initiative Spatial Methods Team in 2014 (https://www.sciencebase.gov/catalog/folder/52050595e4b0403aa6262c64); and *The Washington Connected Landscapes Project: Analysis of the Columbia Plateau Ecoregion*, and two associated analyses, completed by the Washington Habitat Connectivity Working Group in 2012 and 2013 (http://waconnected.org/columbia-plateau-ecoregion).

The ALI core team members have begun and will continue to work with their colleagues to incorporate these shared priorities into existing management processes and work plans, and to test existing and new collaborative mechanisms that support and facilitate shared resources and collaborative actions. The Arid Lands Initiative is therefore poised to coordinate local conservation efforts so that the actions of public, private and tribal interests will efficiently and effectively lead to conservation of eastern Washington's arid lands and related freshwater habitats for future generations.

SECTION 1. Why We Care About Eastern Washington's Arid Lands

The term "sagebrush sea" has been used to describe the vast expanses of arid lands across much of the western United States. Though Washington is known as the evergreen state thanks to its lush, green west-side forests, the Columbia Plateau ecoregion, which covers a third of the state east of the Cascades Range (see *Arid Lands Initiative's Shared Geography* box), is characterized by a matrix of arid and semi-arid uplands, where rainfall is scarce enough that trees are hard-pressed to persist. Eastern Washington, however, is also dotted and intersected by a diversity of other habitat types (see *Values of the Columbia Plateau* box), where the legacy of glaciers, massive floods during the Ice Age, complex underlying geology and other environmental factors have helped create awe-inspiring cliffs, lakes, ponds, and wetlands, creeks and massive rivers like the Columbia and the Snake, grasslands, steppe and even woodlands at higher elevations.

In addition to the "sagebrush sea" not effectively capturing the diversity of habitats in eastern Washington, it is also a misnomer given the current configuration of the landscape in this ecoregion. Travel from Ellensburg to Spokane, or Okanogan to Pasco, and you will see an intricate mix of habitats, productive wheat fields, irrigated crops, orchards and vineyards. The landscape is also dotted with towns and cities, and crossed by roads, irrigation canals, and transmission lines carrying electricity across the state and beyond.

Value of the Columbia Plateau in Washington

Ecological Values

At least 239 plant and wildlife species [1]

18 of Washington's 53 endemic species [2]

174 of Washington's 538 species of concern [2]

52 of Washington's 98 ecological systems [3]

Economic Values [4]

$3.8 billion dollars in crops annually

$1.1 billion dollars in livestock annually

This comprises approximately 73% of Washington's crop and livestock production

[1] Washington Department of Fish and Wildlife. 2005. Washington's Comprehensive Wildlife Conservation Strategy. http://wdfw.wa.gov/conservation/cwcs/cwcs.html, accessed February 24, 2014.

[2] Washington Biodiversity Council. 2007. Washington's Biodiversity – Status and Threats. http://www.rco.wa.gov/documents/biodiversity/WABiodiversityStatusThreats.pdf, accessed February 24, 2014.

[3] NatureServe. 2013. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 12 July 2013. Accessed through NatureServe Explorer. http://explorer.natureserve.org/ on March 20, 2014).

[4] Data from the most recent published Census of Agriculture (2007; 2012 data to be published in May 2014) for the 15 counties with more than 40 % area in the Columbia Plateau (Adams, Asotin, Benton, Columbia, Douglas, Franklin, Garfield, Grant, Kittitas, Klickitat, Lincoln, Spokane, Walla Walla, Whitman, and Yakima Counties).

If you look at the pattern of land ownership in eastern Washington[1], two things are likely to strike you. First, the majority of the Columbia Plateau landscape is under private ownership, which produces crops and livestock valued in the billions of dollars annually (see *Values of the Columbia Plateau* box). Second, you might notice that public lands are scattered, with parcels of varying sizes managed by different local, state, and federal entities, some clustered in certain areas, others broadly distributed across the region. The complexity and diverse nature of the vegetation, of the uses of the land, and of land ownership across the region are all key characteristics of the Columbia Plateau in Washington state.

Conserving eastern Washington's natural resources is important not only because of their intrinsic value, but also because of their impact on the region's economy and growth. The challenge faced by people and organizations interested in conserving eastern Washington's arid lands is two-fold:

- No person or entity has the authority, resources or ability to do everything that needs to be done, at the scale that it needs to be done, given the land ownership configuration in this ecoregion.

[1] A map showing the major public lands in Washington is published by the Washington Department of Natural Resources and can be found at http://www.dnr.wa.gov/Publications/eng_rms_trustlands_map_nu2.pdf (accessed February 24, 2014).

- Conservation cannot be accomplished solely by protecting and restoring large areas, given the complexity of values and land uses across the ecoregion.

Arid Lands Initiative Shared Geography

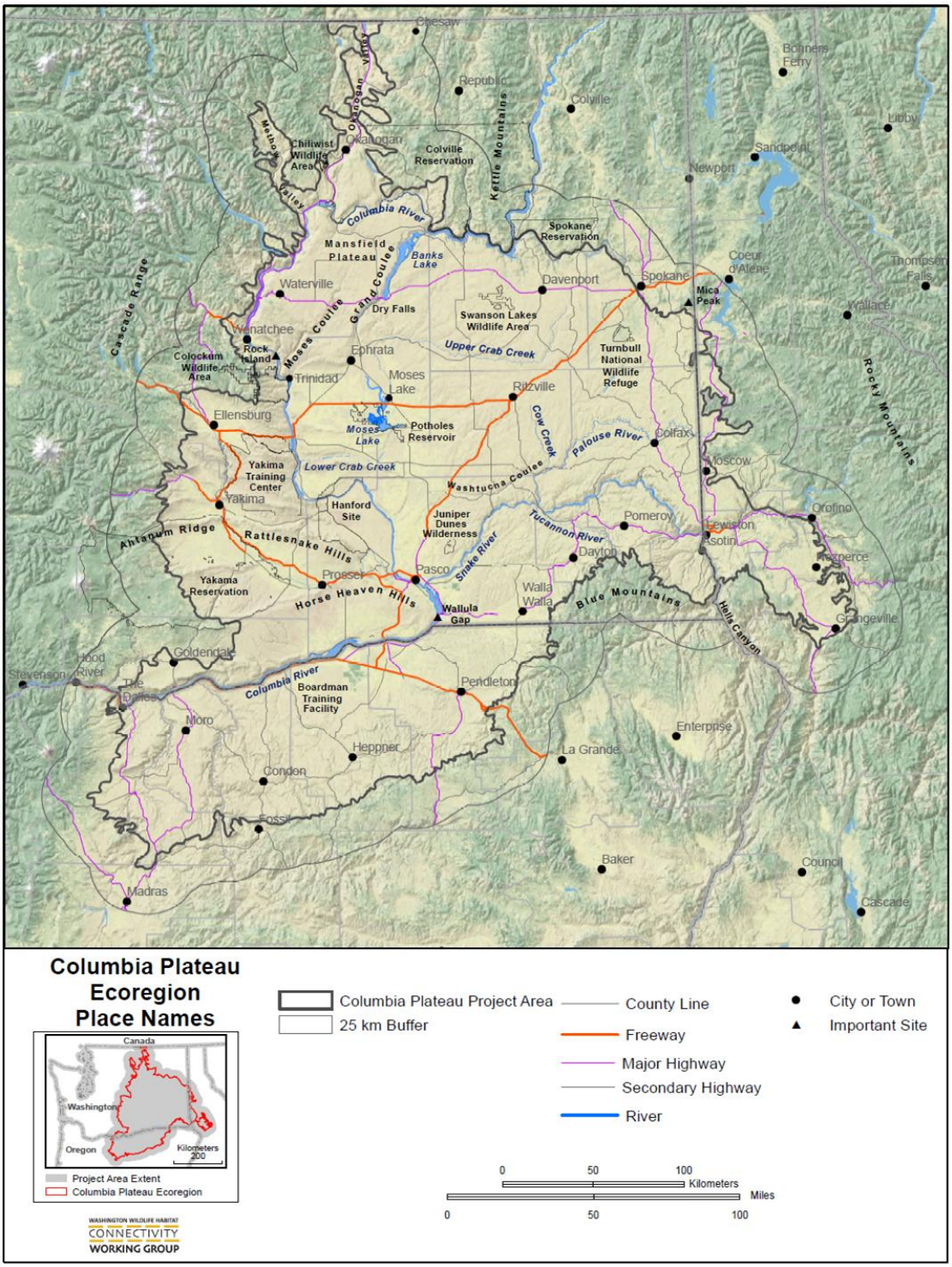


Figure ES.1 from WHCWG 2012. The Columbia Plateau Ecoregion showing common geographic features and place names. *Copied with permission from WHCWG 2012 (http://waconnected.org/columbia-plateau-ecoregion/ accessed March 7, 2014).*

In light of these challenges, conserving eastern Washington's natural resources requires the investment and commitment of diverse stakeholders and entities working at multiple scales (individual farms and ranches, counties, and across the region), and on a diversity of actions: from protecting habitat through land use planning and permitting actions, directing and mitigating the impacts of new infrastructure, to restoring vegetation and expanding the use of sustainable agricultural practices. These diverse actions are already being implemented in many ways and in many places across this striking landscape. However, there is an urgent need to coordinate these actions, which are carried out by multiple stakeholders with varied interests in this landscape and with different mandates and objectives. With such coordination the outcome of these actions would become greater than the sum of the site-specific projects, and together lead to the conservation of a whole, diverse ecosystem.

Responding to this need for coordination across the region, the Arid Lands Initiative (ALI) was formed in 2009. This document describes who is currently part of the ALI core team, and our shared vision for this landscape's future. It articulates our shared priorities, including the systems and species we are striving to conserve, the actions we agree need to be coordinated to achieve landscape-level conservation, and the areas across the ecoregion where we agree these actions should be focused first. Together, these priorities comprise key components of a coordinated strategy for conservation of eastern Washington's arid lands and related freshwater habitats.

We recognize that doing what is needed at a scale that is meaningful to achieve a healthy and productive ecosystem across the region will also require new partnerships with other stakeholders interested in these natural resources, as well as coordination of actions occurring at local scales, so that each partner can play to their strengths, is critical. This document also outlines the next steps needed to make progress in these aspects, so we can implement diverse projects in a coordinated fashion to achieve our shared vision for this landscape.

SECTION 2. The Arid Lands Initiative – Agreeing on Shared Conservation Priorities

What the Arid Lands Initiative is trying to achieve and how

The entities that came together on the Arid Lands Initiative's core team (see *Arid Lands Initiative Core Team* box) reflect a range of missions and mandates, as well as diverse geographic, policy, regulatory, and technical expertise and responsibilities. However, we quickly converged on a shared vision of what successful landscape-scale conservation of eastern Washington's arid lands looks like (see *Arid Lands Initiative Shared Vision* box). We recognized that achieving this ambitious vision requires us to (a) collaboratively develop a coordinated conservation strategy, and (b) implement this strategy in a coordinated fashion across the ecoregion with our partners and stakeholders (see *Arid Lands Initiative Coordinating Goal* box). This document articulates our shared priorities, which comprise the foundational components of the coordinated strategy, providing the basis and guidance for implementation and coordination of actions by ALI partners. It also describes the steps we anticipate taking to complete the final component of the

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coordinated strategy – agreeing on partners' roles in carrying out specific actions in particular places – as well as steps to facilitate and coordinate those actions.

Arid Lands Initiative Shared Vision

The Washington Arid Lands Initiative represents a diverse assemblage of public, private and tribal interests working together to conserve and restore a viable, well connected system of eastern Washington's arid lands and related freshwater habitats, sustaining native plant and animal communities, and supporting compatible local economies and communities.

A series of overarching principles acted as the foundation to our discussions on shared priorities for landscape-scale conservation (see *Overarching Principles Supporting our Shared Priorities* box). These principles describe the ALI core team's understanding of how the ecosystems and species in the Columbia Plateau function, and the need for coordinated action to conserve them. This shared understanding provided sideboards to our efforts to narrow in on shared priorities, focusing on where the Arid Lands Initiative could add value and make a difference to landscape-scale conservation.

The shared priorities for landscape-scale conservation described in this document are organized into three aspects:

- **Biological priorities:** the focal systems and species that we are striving to conserve, and whose successful conservation is the foundation for achieving our shared vision;
- **Strategic priorities:** actions we agree will be necessary to conserve these focal systems and species, and whose coordination at a landscape scale is critical for achieving our shared vision; and
- **Spatial priorities:** the areas where these actions need to be implemented first, in order to conserve those systems and species in ways that add up at the landscape scale.

Arid Lands Initiative Coordinating Goal

The goal of the Washington Arid Lands Initiative is to develop and cooperatively implement a coordinated strategy for the conservation of Washington's arid lands, including shrub steppe, Palouse grasslands and those freshwater systems contained within the arid lands landscape.

The coordinated strategy shall include:

- ✓ Systems and species we are striving to conserve (biological priorities);
- ✓ What actions we agree are most necessary to conserve them (strategic priorities);
- ✓ Priority areas where we agree we must act first (spatial priorities); and
- ✓ Articulation of where each partner is best placed to achieve conservation outcomes (roles).

These priorities are meant to more narrowly and specifically define what and where we agree the Arid Lands Initiative needs to invest to leverage each partner's actions towards achieving the viable, well-connected system of arid lands and related freshwater habitats we envision.

Overarching Principles Supporting our Shared Priorities

- Natural systems and species ignore ownership and political boundaries, so their conservation across the Columbia Plateau's intricate matrix of land uses and ownerships requires coordination across this large landscape to be successful.
- From an ecological perspective, we agree that a viable, well-connected system must be comprised of a network of core areas and functional linkages between them, and that their distribution must consider not only current conditions but also the likely impacts of climate change.
- The effects of climate change are issues that need to be addressed at an ecoregional scale. Incorporating climate change considerations throughout the development of this coordinated strategy will allow us to both have arid lands in eastern Washington into the future, and to conduct durable conservation actions.
- The diversity of systems and species across the region, and the difference in their abundance, status and distribution, makes it a challenge to manage each individually. Therefore, we need to focus on a selection of priority systems and species for our conservation actions to achieve their desired impact.
- We consider the Columbia Plateau ecoregion is both large enough to reflect what is important for the short-term and long-term persistence and vigor of the systems and species we are striving to conserve, while small enough to reflect ecological, socio-economic and political similarities influencing efforts to conserve its natural resources.
- Partners can and will have their own priorities in addition and complementary to the Arid Lands Initiative's shared priorities. The ALI's focus is on *shared* priorities, and there is no expectation that these will constitute partners' only priorities, as each partner is guided by different missions and mandates.
- Once priorities for conservation are articulated for the ecoregion, much work will be needed in strategic places with specific private and tribal managers and decision-makers to best achieve our shared vision of ecologically viable systems supporting compatible economic activities.
- The Arid Lands Initiative's shared priorities are only as valuable as the guidance they provide to implement strategies and projects in real places. It is the intent of the Arid Lands Initiative, therefore, to evolve from a planning entity focused on articulating shared priorities into a coordinating entity ensuring that the projects and actions partners carry out across the Columbia Plateau result in long-term conservation success at a meaningful, landscape scale, and are implemented by most efficiently bringing to bear the strengths of individual partners and of the partnership itself.
- We see the Arid Lands Initiative as a living and dynamic partnership, adapting to change, both driven by ALI partners and by other forces. Such adaptation is only possible as long as we are collecting information on key indicators of change in the ecological and socio-economic systems of the Columbia Plateau, and measure our success at achieving our goals.

The process followed by the Arid Lands Initiative to agree on shared biological and strategic priorities

There are multiple ways to articulate shared priorities, and a myriad of frameworks and tools to facilitate the process. The Arid Lands Initiative core team selected The Nature Conservancy's Conservation Action Planning (CAP) process[2] to help organize and focus discussions on these shared priorities. This process has been used extensively by The Nature Conservancy, and follows similar steps to many of the ALI partners' own planning

[2] The Conservation Action Planning (CAP) process follows an adaptive management project cycle, and is part of the Open Standards for the Practice of Conservation (www.conservationmeasures.org), created to credibly assess and improve the effectiveness of conservation actions (http://www.conservationmeasures.org/wp-content/uploads/2013/05/CMP-OS-V3-0-Final.pdf, accessed December 30, 2013).

processes, such as the U.S. Fish and Wildlife's Strategic Habitat Conservation[3], Washington Department of Fish and Wildlife's Conservation Initiative, and the U.S. Department of Interior's Adaptive Management technical guidance[4]. These similarities, the broad professional agreement on the value of the CAP process, and the fact that the ALI partner entities already had in-house expertise in carrying it out, led to our selection of this process to guide our efforts to articulate shared biological and strategic priorities.

Subsequent discussions resulted in the shared priorities summarized in this document. Individuals representing the ALI partner entities participated throughout these discussions, and we also received valuable input from a broad array of experts and stakeholders interested in the multiple values of the natural resources of the Columbia Plateau (see *Contributing Experts and Stakeholders* box).

The science used to map shared priority areas

As described earlier, the coordinated strategy includes not only biological and strategic priorities, which we agreed upon through the CAP process, but also includes spatial priorities: areas where the Arid Lands Initiative core team agrees these actions need to be implemented first. The ALI core team based its identification of shared priority areas on two analyses developed specifically for the Columbia Plateau ecoregion, with our input and interpretation:

- The *Spatial Conservation Priorities in the Columbia Plateau Ecoregion – Methods and data used to identify collaborative conservation priority areas for the Arid Lands Initiative*, completed by the Arid Lands Initiative Spatial Methods Team in 2014 (https://www.sciencebase.gov/catalog/folder/52050595e4b0403aa6262c64), and
- The *Washington Connected Landscapes Project: Analysis of the Columbia Plateau Ecoregion*, and two associated analyses, completed by the Washington Habitat Connectivity Working Group in 2012 and 2013 (http://waconnected.org/columbia-plateau-ecoregion).

The ALI core team selected a set of priority areas across the ecoregion using key results from these two analyses. These priority areas include core habitat patches, and important linkages for keeping those core patches connected. This document does not describe the analyses mentioned above in detail, which can be found in their respective reports. Rather, we focused on articulating the rationale behind the ALI's use of these analyses' results, and the foundational links between them and the ALI's shared biological priorities, which support that rationale.

[3] http://www.fws.gov/landscape-conservation/shc.html (accessed March 7, 2014).
[4] http://odp.trrp.net/FileDatabase/Documents/USDI%20Technical%20Guide%20-%20Adaptive%20Management_reduced1.pdf (accessed March 7, 2014).

Contributing Experts and Stakeholders

In addition to the members of the Arid Lands Initiative core team, multiple individuals and entities contributed expertise and knowledge to the selection of the Arid Lands Initiative's focal systems and species (biological priorities), the definition of their integrity and viability, the description of human impacts and their socio-economic and political drivers, the development of priority actions (strategic priorities), and the selection of priority areas (spatial priorities). Contributors to the development of the science products that provided the foundation for the selection of spatial priorities can be found in the respective reports (https://www.sciencebase.gov/catalog/folder/52050595e4b0403aa6262c64 and http://waconnected.org/columbia-plateau-ecoregion).

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Julie Conley – South Central Washington Shrub Steppe and Rangeland Partnership

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SECTION 3. Priorities Shared by Arid Lands Initiative Partners

The first step in agreeing on priorities was to define the geography in which we have a common interest. The Arid Lands Initiative core team defined the geographical focus of the coordinated strategy as "*the Columbia Plateau Ecoregion within Washington's state boundaries, including the shrub steppe within the Okanogan Valley and valleys in the East Cascades"* (see *Arid Lands Initiative's Shared Geography* box). As described in the overarching principle that states that natural systems and species do not respect political or ownership boundaries, we recognized that the integrity of eastern Washington's native systems depends in part on what happens in surrounding states and ecoregions, particularly under a changing climate. It therefore made sense to rely on scientific analyses that were developed for a broader geography, including those portions of the Columbia Plateau in surrounding states (*Spatial Conservation Priorities in the Columbia Plateau Ecoregion* analysis), as well as a buffer into surrounding ecoregions (*Washington Connected Landscapes Project*) (see further detail in the *Shared priority areas* section, below).

Shared biological priorities – Systems and species we are striving to conserve

In order to achieve the biological components of our vision – a viable, well-connected system of arid lands and related freshwater habitats – the ALI core team agreed to focus on eight focal systems and species that we considered representative of the majority of the biological diversity in eastern Washington's arid lands (see *Shared Biological Priorities* box). A basic premise of the CAP process is that, if these carefully selected focal systems and species are conserved over the long term, the conservation of a much larger suite of systems and species occurring in this arid landscape would be achieved, as well as the conservation of the critical processes that drive and sustain them. Accepting this basic premise also requires accepting the fact that not all systems and species currently occurring in the Columbia Plateau will be effectively conserved in this way; there will be a suite of species whose conservation will require specific attention to their condition and the activities that impact their persistence. However, the ALI core team agreed that, by focusing on this set of eight systems and

Shared Biological Priorities

Matrix systems

Shrub Steppe and Dry Grasslands – This focal system includes the majority of the uplands across the ecoregion, including shrublands, shrub steppe, scablands, and grasslands.

Riverine Systems – This focal system includes all courses of running water – whether permanent or seasonal – their stream channels, floodplains and the riparian and wetland vegetation they support.

Depressional Wetlands – These systems are distinguishable from the riverine systems in that the source of water is local, and remains contained in the lake or wetland. They include wetlands that contain open water for most of the year, or those with water only for a short season.

Fine-scale systems – these systems occur in patches within the matrix systems described above

Dunes – This focal system is characterized by sandy soils, and includes active dune systems where sands are being shifted by wind, to stabilized dunes covered in shrubland, shrub steppe, grassland and even woodland vegetation.

Transitional Woodlands – This focal system occurs mostly along the outer edges of the Columbia Plateau ecoregion, and is characterized by the presence of trees in upland areas.

Cliffs, Talus and Caves – This system is characterized by its landforms, including steep cliff faces, narrow canyons, unstable scree and talus slopes below cliffs, and smaller rock outcrops.

Species of additional concern – for whom conserving the systems they depend on is not enough

Grouse - The two grouse species in the Columbia Plateau – Greater Sage-grouse and Sharp-tailed Grouse – have specific needs to persist in this landscape that go beyond quality habitat, which is why we singled them out as focal species.

Burrowing Animals – Another suite of species we singled out are those that have specific soil requirements in which to burrow, requirements similar to those of agriculturally productive soils. The most representative of these species are the Washington ground squirrel and the Townsend's ground squirrel.

species as shared biological priorities, our efforts at a landscape scale would make the most progress towards our shared vision. In doing so, we would likely contribute to the conservation of most – if not all – species, thereby supporting the efforts of individual partners working to conserve those systems and species not effectively covered under the umbrella of our shared priorities.

The focal systems selected by the ALI core team as shared priorities included broad-scale systems that comprise the matrix of lands and waters across the ecoregion (Shrub Steppe and Dry Grasslands; Riverine Systems; and Depressional Wetlands), and finer scale systems that have unique qualities and occur interspersed in that matrix (Dunes; Transitional Woodlands; and Cliffs, Talus and Caves). These systems therefore include not only the dominant vegetation types across the ecoregion, but also those systems that, though they account for a relatively small amount of area, contribute a disproportionately large amount to the biological diversity in eastern Washington's arid lands, either because of the richness of species they support (e.g. wetland and riverine systems), or because they provide for key needs of certain species that would otherwise not persist in this landscape (e.g. nesting raptors and roosting bats in cliffs). In addition, we also focused on a suite of species whose needs and the factors affecting their viability would likely not be fully conserved if our focus were solely on their habitats, and that were of priority interest to multiple ALI partners (Grouse; and Burrowing Animals) (see *Shared Biological Priorities* box).

Shared strategic priorities – What actions are necessary to conserve our biological priorities?

With the help of experts and stakeholders knowledgeable about our shared biological priorities and about the social, economic and political context of eastern Washington (see *Contributing Experts and Stakeholders* box), the Arid Lands Initiative core team discussed what actions would be needed to achieve our shared vision.

Is action needed across the ecoregion to conserve the integrity and viability of our focal systems and species?

First we agreed on which systems and species require attention and action to ensure their conservation, and why. We did this by first comparing (a) our best understanding of the health (viability and integrity) of each of our focal systems and species across the Columbia Plateau in Washington (see *Viability and Integrity Summary* box), with (b) our long-term, ecological goal for each biological priority (see *Biological Goals* box). We then defined what impacts – natural or human-caused – are leading to any degradation or decline in the focal systems and species' integrity or viability (see *Critical Impacts* box), and (c) we discussed the social, political, economic and institutional factors driving these impacts.

This snapshot of the integrity and viability of the ALI's shared focal systems and species paints a clear picture that encourages action. Overall, the integrity and viability of these systems and species were considered "fair". This means that:

- they are degraded in at least some key aspects that contribute to their health and ability to provide habitat to wildlife and goods and services to people,
- they are vulnerable to further degradation, but
- they are not so degraded that restoration and recovery is impossible.

This vulnerability combined with the opportunity for success highlights the need for ecoregional-scale action now to restore these focal systems and species to a healthy condition, so that they will persist and continue to provide the habitat, goods and services valued by all stakeholders interested in arid lands in eastern Washington.

Viability and Integrity Summary

Focal System or Species	Landscape Context	Condition	Size	Viability/Integrity
Shrub Steppe and Dry Grasslands	Fair	Fair	Poor	Fair
Riverine Systems	Unknown	Unknown	Unknown	Unknown
Depressional Wetlands	Fair	Fair	Fair	Fair
Dunes	Poor	Fair	Poor	Poor
Transitional Woodlands	Fair	Fair	Poor	Fair
Cliffs, Talus and Caves	Good	Unknown	Good	Good [1]
Grouse	Poor	Poor [2]	Poor	Poor
Burrowing Animals	Poor	Poor	Fair	Poor
Overall Viability/Integrity				**Fair** [3]

[1] This overall rank assumes that the condition of the vegetation in and around cliffs, talus and cave systems is no worse than other focal systems' condition – i.e. fair.
[2] Population growth rates for Sharp-tailed Grouse are high, due in part to translocation of birds from other states. However, natural growth rates for Sage-grouse are low, particularly in the Joint Base Lewis-McChord Yakima Training Center population.
[3] The overall viability/integrity of the system would be considered "fair" under all possible scenarios of integrity of the riverine systems (i.e. if the riverine systems' integrity were found to be poor, fair, good or even very good).

Description of Ranks of Focal Species and Systems' Viability and Integrity

Very Good – Requires little human intervention, as the system or species is functioning at its ecologically desirable status.

Good – System or species is functioning within the range of acceptable variation, but may require human intervention to maintain this status.

Fair – System or species is functioning outside of the range of acceptable variation, so requires human intervention as it is vulnerable to serious degradation if left unchecked.

Poor – If system or species remains in this condition for extended periods of time, restoration or prevention of extirpation will be practically impossible.

The composite ranks developed for each priority system and species, and then across all biological priorities were developed following the guidance of the CAP process. Description of how these ranks are synthesized can be found under the Help icon at http://www.conservationgateway.org/Files/Pages/conservation-action-plannaspx122.aspx (accessed December 26, 2013).

What actions are necessary to achieve our shared vision of a viable, well-connected system or arid lands and related freshwater habitats?

The evaluation of whether action is needed and why helped us focus our discussions. We first identified and prioritized what actions across the ecoregion would allow us to abate critical impacts and restore our focal systems and species' integrity and viability. With the help and input from contributing experts and stakeholders, we brainstormed a wide variety of actions that would change the trajectory of degradation or impact on our

focal systems and species, and would make progress towards our stated goals for each (see *Biological Goals* box). We then selected six strategic actions that we agreed were both shared priorities for the ALI partners, and for which coordination across the landscape could lead to significantly greater progress towards our shared vision. The six shared priority actions selected by the ALI core team are:

- **Protection**: Identify and protect priority lands through long-term techniques, such as conservation easements, land acquisition or other voluntary landowner incentives.
- **Restoration**: Improve or develop restoration approaches so that restoration projects are ecologically successful and economically viable.
- **Development**: Work with local governments to improve local Critical Area Ordinance (CAO) policies and development regulations.
- **Energy Development**: Minimize and mitigate for deleterious impact on conservation targets and priority areas by energy developments and related operations.
- **Agriculture**: Focus public funding and develop markets to reward maintenance and enhancement of environmental benefits on working lands in our arid environments.
- **Grazing**: Encourage the development and utilization of sustainable grazing practices.

Biological Goals

These goals were developed with existing information in 2011, and with the explicit recognition that these goals are incomplete for some systems and species (e.g. riverine systems). As new data and understanding on the context in which these systems and species are embedded, the size, distribution and connectivity of patches, and the condition of the vegetation and animal populations become available, these goals will be revised. In addition, as climate change impacts become clearer, additional scrutiny will be applied to these goals, to ensure that the Arid Lands Initiative is focusing on achieving goals that remain durable as the climate changes, and favoring appropriate adaptation of these systems and species to climatically driven changes and transitions to new states. Greater detail on what defines the condition of each priority and its desired status, as well as the sources of the information used can be obtained by contacting the ALI core team members.

Matrix systems

Shrub Steppe and Dry Grasslands – Between 2011 and 2031, there is no net loss of shrub steppe, grasslands and scablands; additionally, no functional core patches or high value areas are lost, the size and condition of core patches is improving, and the connectivity between core patches is being enhanced.

Riverine Systems – This Between, 2011 and 2031, there is no net loss of current functioning riverine systems and viable strategies are in place to inventory and prioritize, protect and restore priority reaches and watersheds.

Depressional Wetlands – Between 2011 and 2031 depressional wetlands are maintained, and their condition and the condition of the surrounding landscape are improving.

Fine-scale systems

Dunes – Between 2011 and 2031, the size of the 21 existing dune systems is maintained or increasing through restoration of adjacent sandy soil areas; additionally, the condition of these systems and of the surrounding landscape is improving.

Transitional Woodlands – Between 2011 and 2031 there is no net loss of transitional woodlands, and no loss of patches greater than 250 acres in size; additionally, the condition of these woodlands is improving, increasing the acreage in Fire Regime Condition Class 1 (i.e. less than a third of the landscape is outside the range of vegetation and fire conditions expected based on our understanding of what the landscape was like historically).

Cliffs, Talus and Caves – In 2031, 80% of cliffs, talus and caves are intact, the condition of surrounding vegetation is improving, and the connectivity between cliffs, talus and cave occurrences is being enhanced.

Species of additional concern

Grouse - By 2031, Greater Sage Grouse and Sharp-tailed Grouse populations in Washington each surpass 3,200 birds, their population trend is increasing, and subpopulations are connected.

Burrowing Animals – By 2031, ground squirrel populations – representative of other burrowing animals – occur in functional patches of suitable habitat; each population has more than 75 squirrels/ha (30 squirrels/acre), and populations are connected.

Critical Impacts

We identified natural or human-caused factors that are likely to drive the most important impacts on our focal systems and species' health over the next ten years. We focused on those activities that contributed to the most important impacts on our biological priorities, and that over the next ten years were likely to have driving and irreversible impacts on the systems' and species' health and ability to provide habitat and goods and services to people. The critical impacts we focused on are:

- Residential and commercial rural development
- Expansion of road networks
- Energy development, particularly renewable energy, and infrastructure expansion

Development, construction of roads and infrastructure can impact systems and species' ability to continue to function as a well-connected system, and to provide the goods and services valued by an array of stakeholders across eastern Washington.

- Agricultural practices

Agricultural lands, particularly those in close proximity to native habitat and those with permanent vegetation cover (e.g. lands under the Conservation Reserve Program) provide significant benefit to the focal systems and species that the ALI identified as biological priorities, but realizing those benefits depends on how those lands are managed.

- Invasive species
- Frequent and larger wildfires

The ALI's biological priorities are threatened, as are many other systems and species across the western United States, by invasive species that outcompete them, or that radically change the characteristic and dynamics of the system (see *Cheatgrass in Shrub Steppe* box). One such way the dynamics are changed is by increasing the frequency and extent of wildfires that can lead to the elimination of sagebrush and other important species for a long period of time.

- Climate change

The ALI core team agreed that, though the exact nature of the impacts of climate change on our biological priorities are still uncertain, we need to be ready to support adaptation of these arid systems and dependent species to climatic changes. Through collaboration and integration of new understanding into the ALI's biological, strategic and spatial priorities we expect to encourage scientific and institutional readiness, and ensure our actions to sustain our focal systems and species are robust to expected changes.

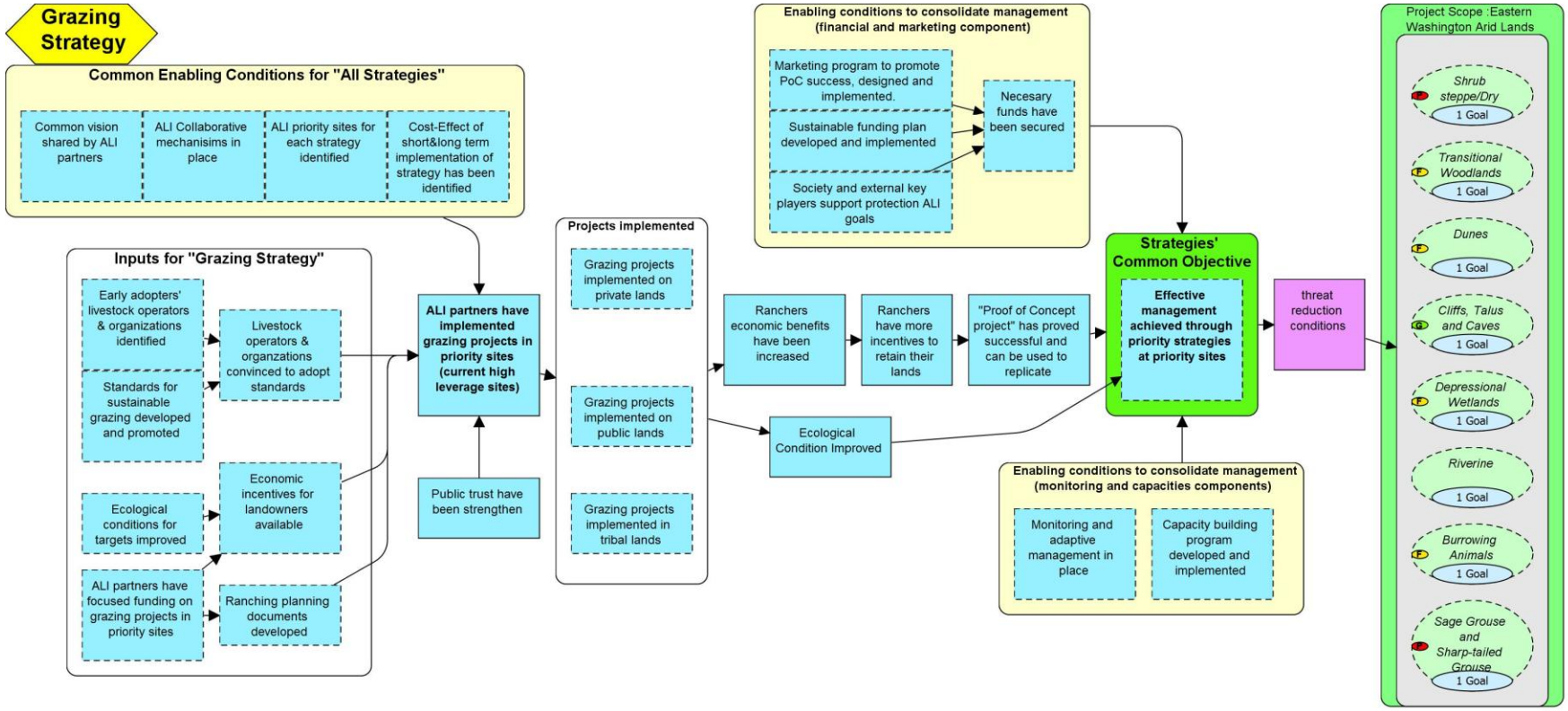
Once we agreed on these shared strategic priorities, we articulated the logical chain of results that would lead from our actions to successfully achieving our goals (see *Example Chain of Logic* box). Each of these results chains included:

- a set of enabling conditions critical for our actions to be effective in achieving the stated results;
- compilation of necessary information, and the development of key on-the-ground partnerships with new stakeholders (see *Partnerships for Developing ALI Pilot Projects* box);
- an implementation phase of conducting pilot projects with our new partners to test how to best achieve multiple shared objectives;
- a second set of enabling conditions that would allow the ALI partners to effectively scale up the successful pilot projects across millions of acres in eastern Washington (see *Enabling Conditions for Scaling Up from Pilot Projects to All of Eastern Washington's Arid Lands* box); and finally,
- a scaling up phase to implement the strategy across the whole ecoregion.

Example Chain of Logic

The diagram below articulates the logical chain of results that would lead from our actions to successfully achieving our goals. As part of the process to agree on shared strategic priorities, the ALI core team developed similar diagrams for all six strategic priorities. These diagrams provide the foundation for future discussions to agree on where each ALI partner is best placed to achieve conservation outcomes, and to identify critical decision-points where monitoring is necessary to determine if the strategies are being implemented as expected (strategy implementation measures), are effectively achieving the expected results (effectiveness measures), and whether those results are actually leading to improving the integrity and viability of our focal systems and species (status and trends measures).

Grazing: Encourage the development and utilization of sustainable grazing practices.



Cheatgrass in Shrub Steppe

The most prevalent example of the impacts of invasive species in eastern Washington's arid lands – though by no means the only one – is the presence of the invasive annual grass, cheatgrass. This species grows early in the spring, "cheating" native species of the moisture stored in the soil over the winter, and only providing decent forage for a very short window of time in the early spring. Cheatgrass then dries out early in the summer, leaving a tinder-like carpet that carries wildfires much quicker, further and hotter than the patchy, partly-green native plants. And these fires have a much greater impact on the native species, especially sagebrush, than on cheatgrass, since one remaining seed can grow and produce hundreds of seeds the next year. This combination of frequent fire – partly due to increased ignitions from human activities – and cheatgrass feeds on itself, in some areas leading to almost complete loss of native species, including sagebrush, in a crop of cheatgrass.

New Partnerships for Developing Arid Lands Initiative Pilot Projects

- **Ranchers** interested in adopting sustainable grazing practices, to improve the ecological condition of the vegetation and the economic benefits to ranchers.
- **Farmers and farming associations** interested in funding and incentives to enhance the environmental benefits provided by working lands.
- **Counties** considering ways to improve local Critical Area Ordinance policies and development regulations, facilitating their use of available data and tools related to ALI partners' shared biological priorities.
- Partners in the **energy industry** interested in minimizing their environmental impact, applying lessons learned and new technologies, and using the ALI's shared biological priorities to develop a siting and mitigation framework.
- **Landowners** willing to protect and restore lands in priority areas using tools and approaches that both serve the interests of the landowners and provides the protection and restoration needed to achieve ALI goals.

Enabling Conditions for Scaling Up from Pilot Projects to All of Eastern Washington's Arid Lands

Monitoring and Adaptive Management: We need monitoring to evaluate the progress made by pilot projects, and adaptive management plans to guide how to adjust actions to effectively scale up to the whole ecoregion.

Society: We also need societal support for the Arid Lands Initiative's goals, which will likely depend on showing the measurable value landscape-scale conservation provides to habitat, species and people's values.

Funding: Public funds for protection, restoration and incentives for improving management, industry funding for mitigation, and market-based funds for goods and services provided by lands managed in ways that are compatible with conservation goals need to be secured and targeted strategically towards action across the ecoregion.

Capacity: The Arid Lands Initiative partners will need to have the capacity and expertise to scale up implementation of successful pilot projects across the ecoregion, monitor their effectiveness and adapt as needed, and coordinate these actions at this broad scale.

As part of the CAP process, the ALI core team articulated in some detail the initial set of enabling conditions that would allow s to launch these priority actions, as well as the measures we should track to determine progress towards our shared goals.

How do we get started? – Initial enabling conditions

To begin successful implementation of our shared strategic priorities across the ecoregion, the ALI core team needs to ensure certain initial enabling conditions are fulfilled:

- **The common vision and shared priorities articulated in this document are embraced by leaders of the ALI partner entities.** This document and its supporting information articulate the shared priorities identified by representatives of each ALI partner entity on the ALI core team. These representatives had their leaders'

support to participate in the CAP process and voice their entity's perspective on these priorities. Now that the ALI core team has completed this process, this support from leadership needs to be re-affirmed for the ALI partner entities to transition to implementation. Such support can take different forms, such as having a Memorandum of Understanding among partner entities; having explicit agency commitment to being the lead entity in implementing those priority actions best aligned with their missions, mandates and authorities; and having processes in place to incorporate the ALI's shared priorities into each entities' strategic and annual work plans.

- **ALI partners' agreement on where we should initially focus implementation of each strategy, and who will take the lead in those areas.** The ALI core team identified shared priority areas (see *Shared Priority Areas for Implementation*, below). However, not all actions need to be implemented equally across those areas, nor will all partners be involved in all strategic priorities, all phases of implementation, or in all geographies. Partners committing to specific actions in particular places will both enable their on-the-ground implementation in those areas, and will also help identify any gaps that require the ALI to pursue additional partners working in those areas.
- **Collaborative mechanisms that facilitate implementation of shared actions and projects, and approaches to evaluate their effectiveness.** Mechanisms may vary depending on which ALI partners collaborate on each project. Examples include mechanisms that would allow partners to share equipment or pool funding; combine and share monitoring approaches, data, and information; or establish shared management plans across ownership boundaries. Shared monitoring approaches and data would facilitate tracking progress and the contribution of individual projects towards shared landscape-scale conservation goals.
- **Coordinated action facilitated by the structure and function of the Arid Lands Initiative.** We recognize that those individuals within each ALI partner entity working directly on the ground have much more in-depth knowledge of the resources, stakeholders and their objectives, challenges and opportunities in particular priority areas than does the ALI core team. We anticipate shifting the role, structure and composition of the ALI to efficiently engage the right people at the right time and to effectively coordinate implementation, so that projects designed to achieve site-specific objectives also contribute to landscape-scale conservation goals, as well as supporting local communities and their compatible economic development.

Our expectation is that once these enabling conditions are in place, these shared priorities for conservation of eastern Washington's arid lands and related freshwater habitats will provide the foundation for implementation of projects through:

- Current and new partners taking coordinated action. In this way, successful, site-specific conservation and management actions will also contribute to a viable, well-connected system of arid lands and related freshwater habitats, which in turn will allow the natural systems and species we are striving to conserve to adapt to both short-term (e.g. fire) and long-term (e.g. climate change) changes (see *The ALI's Approach to Climate Change* box) ; and
- Forming new partnerships with stakeholders having diverse interests in this landscape. Our first steps will focus on implementing pilot projects with these partners and stakeholders (see *New Partnerships for Developing Pilot Projects* box), and test how to best achieve multiple objectives – sometimes perceived as conflicting objectives – across the region in a way that supports compatible economies and communities.

The Arid Lands Initiative's Approach to Addressing Climate Change

Climate projections for the Columbia Plateau

Climate models generally agree that overall the Columbia Plateau in Washington will be warmer and likely wetter, although summers are likely to be drier. In addition, less precipitation will fall as snow. There is greater uncertainty, however, about what impact this will have on specific vegetation types and plant and animal species. For example, in an evaluation of sagebrush steppe and the key species it supports, modeling results suggest that the northern portion of sagebrush steppe's current distribution in the Columbia Plateau ecoregion will remain climatically suitable, while in the southern portion the climate will become unsuitable for this vegetation type by the end of the century. In addition, when other factors that affect the distribution of vegetation were included in the modeling, results suggest managers should consider a broader range of potential futures in these areas of the Columbia Plateau, from grassland or steppe (based on drier projected climates), to open woodland or even dense forest (in the wetter scenarios) in the north, to even coastal forests or vegetation types that do not currently occur anywhere in North America in the south (extracted and modified with permission from Michalak et al 2014 [1]).

The Arid Lands Initiative's Approach

The Arid Lands Initiative core team identified climate change as one of the highest level impacts likely to affect the integrity and viability of our priority systems and species. Some of the main impacts of climate change, however, are likely to be due to climate change's interactions with other stressors, such as habitat fragmentation, fire and invasion by exotic species like cheatgrass. In addition, the management actions that would address climate change impacts are likely modifications of actions the ALI partners are already implementing. We therefore agreed that rather than having a stand-alone climate change strategy, we would evaluate how climate change might impact our priority systems and species, how it could affect our ability to achieve our shared goals, and how robust our network of priority areas is likely to be to a changing climate. Based on this evaluation, we will adjust our actions, and potentially our goals and priorities accordingly.

The ALI core team and the ALI spatial methods team have engaged in two climate change projects to encourage scientific and institutional readiness to support effective adaptation of arid land systems and dependent species to climate change issues:

1. ***Pacific Northwest Climate Vulnerability Assessment.*** The ALI was the lead management partner in the Columbia Plateau Ecoregion Climate Adaptation Case Study. We worked with the Univ. Washington researchers leading the vulnerability assessment to explore how their science products (climate change projections, projections of changes in vegetation and species distributions, and best available information on species' sensitivities to a changing climate; http://www.climatevulnerability.org/) can be used to develop climate change adaptation strategies. We also provided input on how their results and products can be made more useful for informing the management of species and landscapes. The Case Study report provides a summary of projected impacts of climate change in the Columbia Plateau, resources and guidance to assist with future climate adaptation planning, and an analysis of sagebrush steppe's vulnerability to climate change and possible climate adaptation actions [1].
2. ***Piloting a Strategic Approach to Landscape Conservation Design in the Columbia Plateau Ecoregion: Assessing the Condition and Resiliency of Collaborative Spatial Priority Areas***. Members of the ALI spatial methods team are working to, among other things, assess the future integrity and resilience of the ALI's shared priority areas, establishing a decision support toolkit that integrates regional climate knowledge into planning action. This project is using existing climate change data and tools, such as the Pacific Northwest Climate Vulnerability Assessment and NatureServe's integrative Habitat Climate Change Vulnerability Index (https://connect.natureserve.org/publications/hccvi). This project will provide a decision support system that includes multiple alternative future scenarios integrating climate change with other stressors, and maps showing expected changes across the landscape under each scenario.

As these and other relevant climate change projects are completed, we plan to incorporate this new knowledge, adjusting our actions, and potentially our goals and priorities, to ensure our efforts to conserve and restore a viable, well-connected system of arid lands and related freshwater habitats will have long-term impacts even under a changing climate.

[1] Michalak, JL, Withey, JC, Lawler, JJ, Hall, SA, Nogeire, T. 2014. *Climate Vulnerability and Adaptation in the Columbia Plateau, WA*. Report prepared for the Great Northern Landscape Conservation Cooperative. School of Environmental and Forest Sciences, University of Washington, Seattle, WA.

How will we learn from early implementation projects? – Tracking progress, learning, and adjusting actions

The intent of the ALI core team is that this partnership will facilitate a new way of working with partners in the Columbia Plateau by helping projects contribute effectively to achieving our shared vision of a viable, well-connected system of arid lands and related freshwater habitats across eastern Washington. ALI partners and others are already carrying out actions that contribute to the shared strategic priorities the ALI core team articulated. We expect these partners and stakeholders to innovate and to make valuable contributions related to how to implement these actions, to determining if the necessary knowledge is available, and to evaluating if the on-the-ground partnerships are functioning effectively. We also expect them to be key voices in determining what defines a successful pilot project, as well as a successful scale-up from pilot project to ecoregion. We expect to use such knowledge to modify and adjust the chains of results that will guide the coordinated implementation of our actions. In this way these chains of logic will continue to lay a realistic foundation for identifying critical decision-points where we can determine if the strategies are being implemented as expected (strategy implementation measures), if they are effectively achieving the expected results (effectiveness measures), and whether those results are actually leading to improving the integrity and viability of our focal systems and species (status and trends measures).

We have begun to identify initial, landscape-level measures of success for the priority actions that are more directly under the authorities and purviews of the current ALI partners, such as protection and restoration (see *Example of Measures – Protection and Restoration* box). Further work will be needed to flesh out these measures for all strategic priorities, identifying roles and responsibilities in tracking the associated indicators, and ensuring this information is shared effectively so that decision-makers working at different scales – individual parcel to ecoregion – can adjust the ALI's strategies, and potentially our goals and priorities, to most effectively and efficiently achieve our shared vision.

Shared priority areas – Where should we act first across the ecoregion?

The shared biological and strategic priorities the Arid Lands Initiative core team agreed upon through the Conservation Action Planning process define what we are striving to conserve, what actions will be necessary, and why. As described earlier in this document, the ALI core team agreed that a critical additional aspect of a coordinated strategy was a set of priority areas where such actions should be focused first.

Current land use and land cover in the Columbia Plateau in eastern Washington is an intricate mix of native, semi-native, and agricultural lands, intersected by natural breaks such as rivers and basalt cliffs, as well as by man-made features such as towns, roads, transmission lines and irrigation canals. In this context, the ALI core team agreed that conserving eastern Washington's arid lands and associated freshwater habitats requires action in both core habitat areas and in key linkages that could transform these core habitat areas from a group of "islands" into a connected, functional network of core habitats.

Example of Measures – Protection and Restoration

Strategy Implementation Measures			
Expected Result	**Timing**	**Objectives**	**Indicators**
Protection: Arid Lands Initiative (ALI) priority sites for protection identified.	Short-term	List of priority sites identified within priority landscapes by December 2014.	Criteria for priority site selection. Number of priority protection sites identified.
Protection: Lessons learned from past collaborative protection projects, including new protection techniques.	Short-term	Partners' lessons learned documented by April 2014.	List of lessons learned
Protection: Appropriate ALI partners take lead for sites with supporting partners identified.	Short-term	By 2015, each partner has taken lead for one site.	Number and/or percentage of sites with lead and supporting ALI partners identified.
Protection: Effective stewardship and monitoring plan developed for protected sites.	Mid-term	Within 2 years of priority site being protected, stewardship and monitoring plan is developed.	Number of protected sites with a management and monitoring plan that includes effectiveness measures (desired future condition) for each focal system and species.
Protection: Stewardship and monitoring plans funded and implemented.	Long-term	By 2018, 20% of priority sites will have initiated management under their stewardship and monitoring plan.	Amount of stewardship funds in place. Number of priority impacts reduced. Number of best management practices from grazing and agriculture strategies implemented.
Restoration: Ecological needs for restoration across the network of priority sites assessed.	Short-term	List of priority sites identified by Dec. 2014, and restoration needs assessed at key potential projects.	Number of priority restoration sites identified.
Restoration: Criteria to evaluate projects' ecological contribution are developed.	Short- and mid-term	Synthesis of techniques and metrics of success developed and approved by ALI partners by 2014. By 2018, reporting requirements among agencies that fund projects are aligned and reflect common criteria, to improve consistency.	Initial list of ALI-approved techniques and framework for tracking progress (to be updated as new approaches and techniques are tested). Number of projects and funding sources that report progress using common framework.
Restoration: More efficient and cost-effective restoration methods developed, synthesized and promoted.	Short-term	Synthesis of techniques and metrics of success developed and approved by ALI partners by 2014.	Initial list of ALI-approved techniques and framework for tracking progress (to be updated as new approaches and techniques are tested).
Restoration: Restoration projects implemented on private, public and tribal lands.	Mid-term	By 2020, resource use stakeholders (e.g. ranchers, farmers, tribal members) are partnering with ALI entities to implement restoration projects.	Number of ALI-supported restoration projects on private and tribal lands. Resource use stakeholders' feedback on the benefits of engaging with the ALI on projects.

Example of Measures – Protection and Restoration (cont.)

Effectiveness Measures			
Expected Result	**Timing**	**Objectives**	**Indicators**
Protection: Priority sites are purchased, leased or put into easement or management agreement.	Short-term	By 2015, 20% of priority sites are purchased, leased, or put in an easement/agreement.	Number acres and/or percent of priority sites purchased, leased, or put in easement or agreement.
Protection: Effective portfolio of priority sites is protected.	Long-term	Within 30 years, the viability and integrity of focal systems and species in the original 20% protected priority sites is improved.	Number and/or percent of focal systems and species at protected priority sites that achieve desired future condition. Number of high-level impacts that are reduced to acceptable levels. Number of linkages improved.
Restoration: ALI partners have implemented restoration projects in priority sites.	Short- and mid-term	By 2015, restoration projects are designed to meet ALI criteria. By 2020, 50% of restoration projects meet ALI criteria.	Multiple partners (> 3) involved, with different roles, in each restoration project. Projects use ALI-advocated techniques and common framework for tracking progress.
Restoration: Proof of concept area (POC) has proved successful and can be used to replicate and scale up	Mid- and long-term	By 2020, resource-use partners (e.g. ranchers, farmers, tribal members) are engaged in priority restoration projects. By 2025, restoration projects have led to improved connectivity. By 2025, documented expansion of the impact of ALI through application of approaches and tools across the ecoregion.	Number of ALI-supported restoration projects that include resource-use partners. Restoration projects viewed as positive by resource users. Mid-term: Vegetation condition and wildlife use on restoration projects. Long-term: wildlife population size; measures of connectivity; amount of quality habitat across the ecoregion.

When the Arid Lands Initiative was convened, few analyses existed that ranked and prioritized areas across the Columbia Plateau for conservation action, and those that did – such as the Columbia Plateau Ecoregional Assessment[5] and the Conservation Opportunities Framework[6] – were carried out at a different scale, had different objectives, were outdated, or did not include consideration of connectivity in defining priorities. As we made progress agreeing on biological and strategic priorities, some of the same agencies and non-governmental organizations represented on the ALI core team, in collaboration with other entities (such as the Washington Department of Transportation, the U.S. Forest Service and the University of Washington), were investing funding and leadership in developing the two scientific bodies of work that would provide us with the information needed to identify where across the Columbia Plateau ecoregion it is most important that our shared priority actions be implemented first.

[5] The Nature Conservancy. 1999. Columbia Plateau Ecoregional Assessment: A pilot effort in ecoregional conservation. 71 pp plus appendices (http://waconservation.org/projects/ecoregions/, accessed February 24, 2014).
[6] Washington Biodiversity Council. 2007. Washington Biodiversity Conservation Strategy. 148 pp. (http://www.rco.wa.gov/documents/biodiversity/WABiodiversityConservationStrategy.pdf, accessed February 24, 2014).

Spatial Conservation Priorities in the Columbia Plateau Ecoregion

In 2013, the U.S. Fish and Wildlife Service's Regional Office National Wildlife Refuge System (NWRS) conservation planning team began an analysis across the Columbia Plateau ecoregion to identify priority areas for Land Protection Planning[7]. The planning team's intent was to develop scientific products that would guide such processes within the Columbia Plateau, focusing on traditional NWRS biological priorities. Through a collaboration with the ALI, this project's goal was broadened, embracing the ALI's more comprehensive assessment of ecological values, its collaboratively selected shared biological priorities, and its landscape-scale perspective, which aligned directly with the Service's efforts to implement Strategic Habitat Conservation as a landscape approach to planning.

This collaboration was made operational through the formation of the ALI spatial methods team, comprised of members of the ALI core team and staff from NWRS and partner entities. The goal of the spatial prioritization carried out through this collaboration was to "identify areas in the Columbia Plateau landscape for restoration and protection of current habitat and species distribution that meet ALI and U.S. Fish and Wildlife Service conservation goals and objectives, and provide the foundation for adaptation to a changing climate." The ALI spatial methods team made the technical and methodological decisions that would allow the ALI core team to use the products of this analysis to select core habitat areas across the ecoregion as priority areas for shared action. Critical decisions that allowed the ALI core team to use the products in this way include: the study area, the definition of current habitat and species' distributions of importance to the ALI, and the selection and processing of the data to map them. The impact these decisions had on the ALI core team's ability and confidence in using the analysis results are briefly described below; full details on all the decisions made in the analysis are described in the technical report produced by the ALI spatial methods team[8].

Study area of the spatial prioritization analysis

As the ALI spatial methods team was defining the study area, the Wildlife Habitat Connectivity Working Group (WHCWG) had already completed some initial products (see *The Washington Connected Landscapes Project: Analysis of the Columbia Plateau Ecoregion* section, below). The spatial methods team was therefore able to select a boundary for the spatial prioritization analysis that was compatible with both the needs of the ALI, and the products of the WHCWG. The study area included the whole Columbia Plateau ecoregion in Washington, Oregon and Idaho, plus a small extension in the Okanogan Valley that the connectivity analysis identified as important for Sharp-tailed Grouse, one of the ALI's shared priority species. The results from the spatial prioritization analysis therefore covered the whole area of interest to the ALI in eastern Washington, and incorporate the ecological relations with surrounding states. Though we recognized the importance of links to surrounding ecoregions (see *Overarching Principles* box), these were explicitly excluded from the spatial prioritization analysis, to avoid the different environmental and biological characteristics of those regions

[7] Land Protection Planning is a NEPA process that the NWRS completes prior to establishing authority for acquiring lands. NEPA refers to the National Environmental Policy Act enacted in 1970. This Act establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the federal agencies (http://www.epa.gov/compliance/basics/nepa.html).

[8] Arid Lands Initiative. 2014. Spatial Conservation Priorities in the Columbia Plateau Ecoregion: Methods and data used to identify collaborative conservation priority areas for the Arid Lands Initiative. (https://www.sciencebase.gov/catalog/folder/52050595e4b0403aa6262c64, accessed March 21, 2014).

influencing the identification of the best core areas for conserving the ALI's priority systems and species within the Columbia Plateau ecoregion.

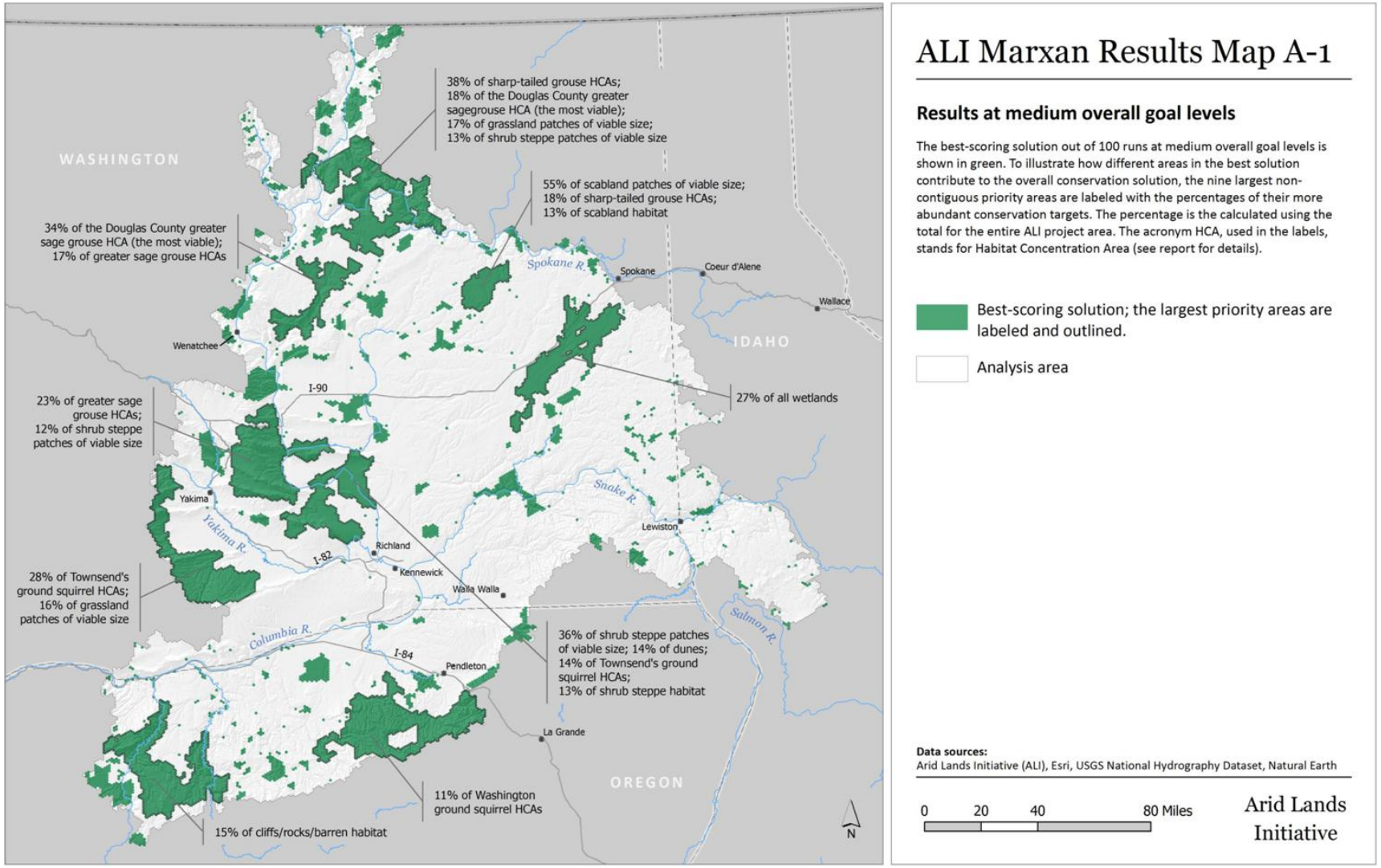
Methodology targets key attributes that determine focal systems' and species' integrity and viability

The methodology used to identify priority areas in the Columbia Plateau ecoregion was very similar to that used in the 1999 Columbia Plateau Ecoregional Assessment (ERA)[9]. However, instead of applying the prioritization tool towards selecting areas that include known occurrences of a long list of systems and species (as done in the ERA), this analysis focused specifically on the focal systems and species selected by the ALI core team as shared biological priorities. In addition, the approach to mapping those systems and species was directly guided by the ALI's synthesis of our best understanding of the attributes that determine these systems' and species' integrity and viability. The resulting priority areas, therefore, reflect the most important areas for ensuring the attributes that determine their health can be conserved across the ecoregion (see *Spatial Prioritization in the Columbia Plateau* box). In this way, the decisions made by the ALI spatial methods team on how to apply a commonly used prioritization method directly focused the results on areas that are likely most important for achieving viable priority systems and species. In combination with the results from the connectivity analysis for the Columbia Plateau (see *The Washington Connected Landscapes Project: Analysis of the Columbia Plateau Ecoregion* section, below), these products provide the foundation for the ALI's selection of areas in which to focus actions first, in our pursuit of our shared vision for eastern Washington's arid lands.

[9] The Columbia Plateau Ecoregional Assessment can be downloaded at http://waconservation.org/projects/ecoregions/ (accessed February 24, 2014).

Spatial Conservation Priorities in the Columbia Plateau Ecoregion

The goal of the spatial prioritization analysis was to identify areas in the Columbia Plateau landscape for restoration and protection of current habitat and species distribution that meet ALI and U.S. Fish and Wildlife Service conservation goals and objectives, and provide the foundation for adaptation to a changing climate. This analysis focused specifically on the focal systems and species selected by the ALI core team as shared biological priorities. The approach to mapping those systems and species was directly guided by the ALI's synthesis of our best understanding of the attributes that determine these systems' and species' integrity and viability (see table). The resulting priority areas, therefore, reflect the most important areas for ensuring the attributes that determine their health can be conserved across the ecoregion. This map, produced by the ALI spatial methods team, represents the best core areas for conserving functional ALI priority systems and species (note: this analysis did not include Riverine Systems).



Copied with permission from ALI 2014.

A detailed version of this analysis can be found in: Arid Lands Initiative. 2014. Spatial Conservation Priorities in the Columbia Plateau Ecoregion: Methods and data used to identify collaborative conservation priority areas for the Arid Lands Initiative. This document and associated files are available online at: https://www.sciencebase.gov/catalog/folder/52050595e4b0403aa6262c64 (accessed March 21, 2014). Coordinators of the Arid Lands Initiative Spatial Methods Team: Sonia A. Hall (SAH Ecologia LLC) and Karen Bicchieri (The Nature Conservancy). For a full list of the Spatial Methods Team see the full report cited above.

Spatial Conservation Priorities in the Columbia Plateau Ecoregion (cont.)

This table shows, for the Shrub Steppe and Dry Grasslands focal system, how the attributes that determine this system's integrity were used to develop the inputs into the spatial prioritization analysis. Similar tables were developed for the other seven priority systems and species.

ALI Focal System	Vegetation Type within ALI Focal System	Marxan "Targets" (inputs to the spatial prioritization model)
Shrub Steppe and Dry Grasslands	Shrub steppe	All areas with shrub steppe land cover
		Size: Shrub steppe patches that are larger than 500 ac
		Landscape Pattern And Structure: Shrub steppe patches larger than 500 ac that have over 60% "natural" LULC classes in a 500m wide buffer around them
		Adjacency: Shrub steppe patches that are larger than 500 ac and are within 1 km cost weighted distance of other patches based on geographically combined ground squirrel resistance raster
		**Fire Regime:* Patches that are larger than 500 ac and are over 60% LANDFIRE Vegetation Condition Class (VCC) 1 and less than 10% VCC 3
	Shrubland	All areas with shrubland land cover
		Size: Shrubland patches that are over 500 ac in size
		Fire Regime: Patches that are larger than 500 ac and are over 60% VCC 1 and less than 10% VCC 3
	Grassland	All areas with grassland land cover
		Size: grassland patches that are over 125 ac in size
		Landscape Pattern and Structure: grassland patches over 125 ac in size that have over 60% "natural" LULC classes in a 500m-wide buffer around them
		Adjacency: Grassland patches that are larger than 500 ac and are within 1 km cost weighted distance of other patches based on geographically combined ground squirrel resistance raster
		**Fire Regime:* Grassland patches that are larger than 125 ac and are over 60% VCC 1 and less than 10% VCC 3
		Potential Palouse grassland remnants identified by Looney and Eigenbrode
Shrub Steppe and Dry Grasslands	Scabland	All areas with scabland land cover
		Size: Scabland patches that are over 100 ac in size
		Landscape Pattern and Structure: Scabland patches over 100 ac in size that have over 60% "natural" LULC classes in a 500m-wide buffer around them
		Adjacency: Patches that are larger than 100 ac and are within 1 km cost weighted distance of other patches based on geographically combined ground squirrel resistance raster
		**Fire Regime:* Patches that are larger than 100 ac and are over 60% VCC 1 and less than 10% VCC 3
	Combined Shrub steppe, Shrubland, Grassland, and Scabland patches	*Size:* Combined patches that are over 500 ac in size
		Fire Regime: Combined patches larger than 500 ac that are over 60% VCC 1 and less than 10% VCC 3
	Rare Species	Hexes that intersect combined patches larger than 500 acres and include documented occurrences of rare species

Table 3 from ALI 2014. Marxan targets for each ALI target. An asterisk (*) indicates that no areas satisfied the criteria. Key attributes are italicized. The Atlas of Inputs (Appendix B in ALI 2014) depicts individual input layers and provides information about how to obtain the data.

Extracted and modified with permission from ALI 2014 (https://www.sciencebase.gov/catalog/folder/52050595e4b0403aa6262c64, accessed March 21, 2014).

The Washington Connected Landscapes Project: Analysis of the Columbia Plateau Ecoregion

In 2012, the Washington Wildlife Habitat Connectivity Working Group (WHCWG), led by the Washington Departments of Fish and Wildlife and of Transportation, completed an analysis to identify the most important areas for maintaining and enhancing wildlife habitat connectivity across the Columbia Plateau (see *Connectivity Analysis of the Columbia Plateau Ecoregion* box). They also developed complementary analyses that identified opportunities to maintain and restore connectivity in ways that will also promote resilience to climate change within the Columbia Plateau, as well as highlighting areas whose loss or whose restoration would have the greatest impact on connectivity. The ALI core team functioned as an ecoregional advisory committee for the WHCWG's Columbia Plateau analyses. In this way, the ALI core team ensured that the Columbia Plateau connectivity analysis products were compatible with and representative of the ALI's biological priorities. Three critical sets of decisions allowed the ALI core team to confidently use the results of the Columbia Plateau connectivity analyses to select the most important linkages between priority core areas for action to conserve our focal species and systems: the geographic scope, the species that were modeled, and the synthesis and interpretation products developed by the WHCWG. The importance of these decisions is briefly described below; full details on each decision are described in the technical reports produced by the WHCWG[10].

The scope of the Columbia Plateau connectivity analyses

The ALI's shared geography (see *Arid Lands Initiative's Shared Geography* box), as well as our overarching principles that species and systems do not recognize political boundaries, and that, especially under a changing climate, their persistence is linked to what occurs in neighboring ecoregions (see *Overarching Principles* box), were also foundational components of the WHCWG's definition of the analysis area for the Columbia Plateau connectivity analyses. Thanks to the shared scope, the ALI core team was able to directly use the Columbia Plateau connectivity analyses' products, as they covered the whole area of interest in eastern Washington, and they incorporate the ecological relations with surrounding states and ecoregions, which impact our focal systems' and species' ability to persist over the long term.

The selection of focal species for which connectivity models were developed

The connectivity analysis for the Columbia Plateau ecoregion was based on connectivity models for eleven focal species, plus additional connectivity models based on landscape integrity (i.e. focusing on areas least impacted by human activity). The ALI core team worked with the WHCWG as they carried out an in-depth, objective process to select focal species that "represent both the needs of wildlife species for which ecoregional-scale planning was relevant and the habitat and connectivity value provided by the main vegetation types across the Columbia Plateau"[10]. This approach to selecting focal species was carried out by a wide array of wildlife biologists working in this region, and has been cited as a successful case study for applying the U.S. Fish and Wildlife Service's Surrogate Species Initiative[11]. The main vegetation types these focal species were selected to represent are directly related to the ALI's shared priority systems. In addition, the selected species also included the ALI's main priority species: Greater Sage-grouse, Sharp-tailed Grouse, Washington Ground Squirrel and Townsend's Ground Squirrel (see *Connectivity Analysis of the Columbia Plateau Ecoregion* box). The systematic

[10] Washington Wildlife Habitat Connectivity Working Group (WHCWG). 2012. Washington Connected Landscapes Project: Analysis of the Columbia Plateau Ecoregion. Washington's Department of Fish and Wildlife, and Department of Transportation, Olympia, WA (http://waconnected.org/columbia-plateau-ecoregion/, accessed February 24, 2014).

[11] http://www.fws.gov/landscape-conservation/stories/columbia-plateau-ecoregion.html (accessed February 24, 2014).

approach to focal species selection and the close relation between the selected species and the ALI's priority systems and species provide the foundation for the ALI core team's use of synthesis products from the connectivity analysis of the Columbia Plateau ecoregion to define priority linkages among important core areas for the same systems' and species' integrity and viability.

Connectivity Analysis of the Columbia Plateau Ecoregion

The goal of the Washington Wildlife Habitat Connectivity Working Group's connectivity analysis was to identify the most important areas for maintaining and enhancing wildlife habitat connectivity across the Columbia Plateau.

The connectivity analysis for the Columbia Plateau ecoregion was based on connectivity models for eleven focal species, plus additional connectivity models based on landscape integrity (i.e. focusing on areas least impacted by human activity). The systematic approach to focal species selection and the close relation between the selected species and the ALI's priority systems and species (see table) provide the foundation for the ALI core team's use of synthesis products from the connectivity analyses of the Columbia Plateau ecoregion (see maps) to define priority linkages among important core areas.

This table shows the focal species selected for the Columbia Plateau connectivity analysis. Text in red was added for this document, showing the ALI priority systems and species. Their location reflects their relation to the connectivity analysis focal species and the vegetation types they were selected to represent.

ALI Systems	**Shrub Steppe and Dry Grasslands**		**Cliffs, Talus and Caves**	**Riverine Systems**	**Depressional Wetlands**	**Dunes**
Focal Species	***Shrub steppe***	***Grassland***	***Cliff, Canyon, Talus***	***Riparian***	***Wetland***	***Dunes***
Sharp-tailed Grouse	X	X	*	X	X	
Greater Sage-Grouse	X	X	*	*	*	
Black-tailed jackrabbit	X	*				*
White-tailed jackrabbit	X	X		*		
Townsend's Ground Squirrel	X	X				*
Washington Ground Squirrel	X	X				*
Least Chipmunk	X	*				
Mule deer	X	X	*	*	*	*
Western Rattlesnake	*	*	X	*	*	*
Beaver				X	X	
Tiger Salamander	*	*	*	*	X	

Table 3.1 from WHCWG 2012. Focal species selected to represent connectivity priorities in six broad vegetation classes. The vegetation class for which a species ranked well enough for selection is indicated with an "X." Additional vegetation classes where a species occurs are indicated with an asterisk. Although no species were chosen specifically to represent Dunes, at least five of the selected species use the Dunes habitat. *Copied with permission from WHCWG 2012* (http://waconnected.org/columbia-plateau-ecoregion/, accessed February 24, 2014).

Connectivity Analysis of the Columbia Plateau Ecoregion (cont.)

This map, published by the Washington Wildlife Habitat Connectivity Working Group (WHCWG 2012), represents the most important areas for functional, connected networks of habitat for a carefully selected set of focal species that represents the ALI's priority systems and species.

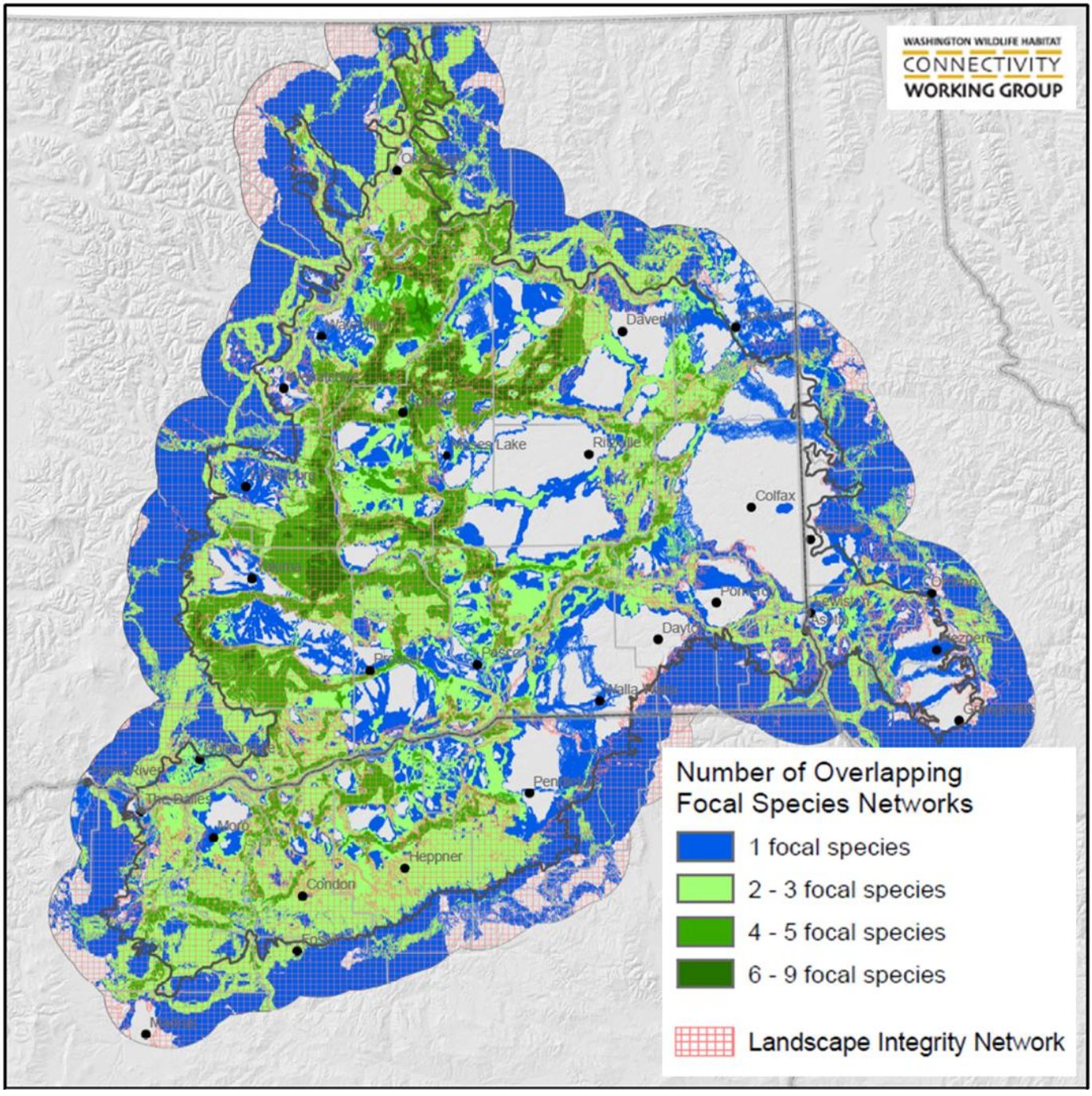


Figure 3.16 from WHCWG 2012. Composite focal species and landscape integrity network for the Columbia Plateau Ecoregion. This map is based on 11 focal species and landscape integrity results. *Extracted with permission from WHCWG 2012*.

A detailed description of the analyses can be found in: Washington Wildlife Habitat Connectivity Working Group (WHCWG). 2012. Washington Connected Landscapes Project: Analysis of the Columbia Plateau Ecoregion. Washington's Department of Fish and Wildlife, and Department of Transportation, Olympia, WA. This document, companion files, and additional Columbia Plateau analyses are available online at: http://waconnected.org/columbia-plateau-ecoregion/

Coordinators of the Columbia Plateau Analysis Team: Sonia A. Hall (The Nature Conservancy) and Joanne Schuett-Hames (Washington Department of Fish and Wildlife). For a full list of the Analysis Team see the full report cited above.

Connectivity Analysis of the Columbia Plateau Ecoregion (cont.)

This map, published by the Washington Wildlife Habitat Connectivity Working Group (WHCWG 2013), represents how important particular linkages are for keeping a whole network connected. The areas highlighted in red and yellow have high linkage centrality, and are therefore expected to be connectivity "gatekeepers"; i.e., important areas for keeping whole ecological systems connected.

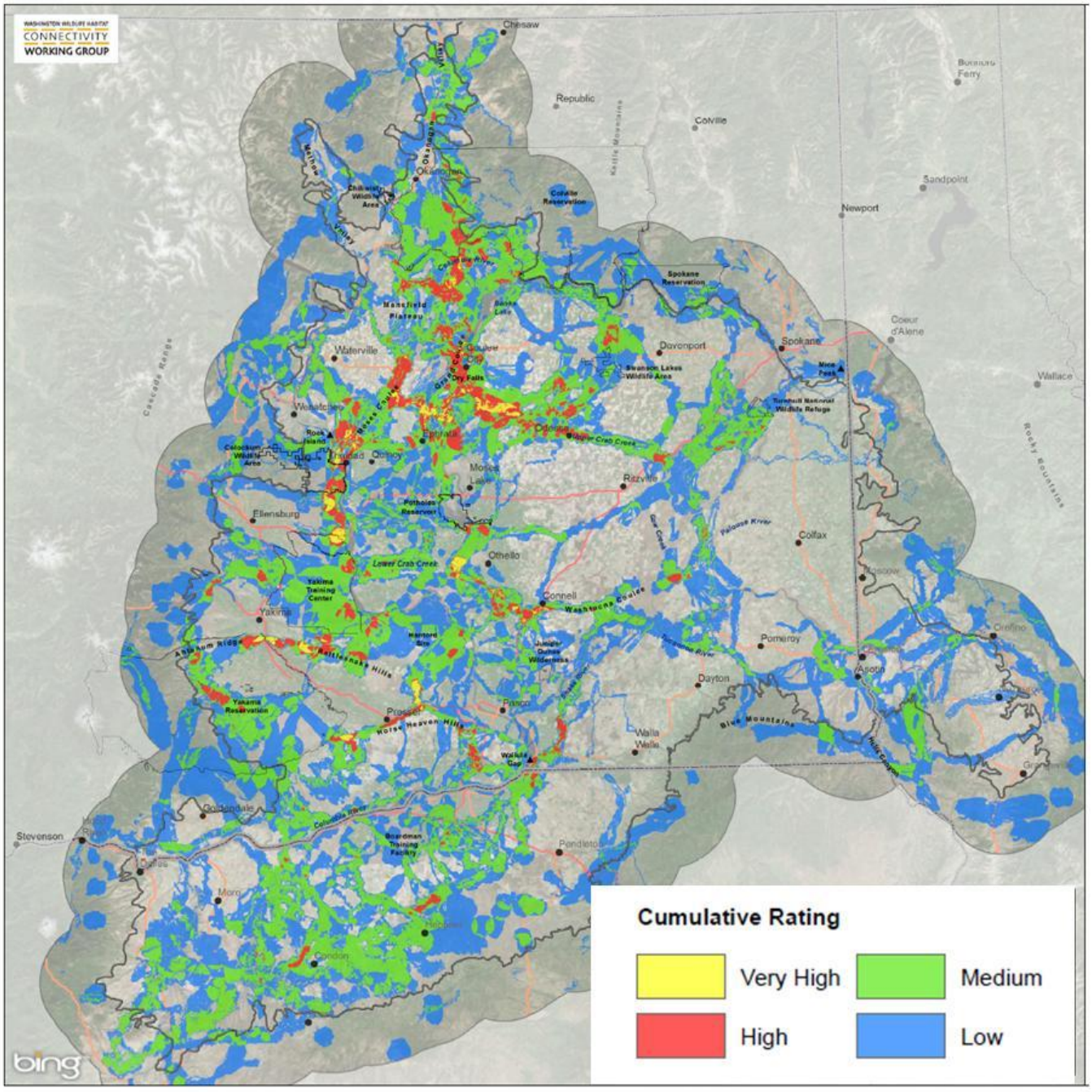


Figure 13.3 from WHCWG 2013. Composite of Linkage Centrality. WHAT IS THE COMPOSITE OF LINKAGE CENTRALITY? Linkage centrality is a measure of how important particular linkages are for keeping a network connected. Linkage centrality was evaluated for each species (Chapters 2–12) using the LinkageMapper Toolbox (see more at http://www.circuitscape.org/linkagemapper). Linkage centrality scores were then summed across the 11 focal species to determine the composite linkage centrality score. *Extracted with permission from WHCWG 2012*.

A detailed description of the analysis can be found in: Washington Wildlife Habitat Connectivity Working Group (WHCWG). 2013. Columbia Plateau Ecoregion Connectivity Analysis Addendum: Habitat Connectivity Centrality, Pinch-Points, and Barriers/Restoration Analyses. Washington's Department of Fish and Wildlife, and Department of Transportation, Olympia, WA. This document, companion files, and additional Columbia Plateau analyses are available online at: http://waconnected.org/columbia-plateau-ecoregion/

Synthesis and interpretation products

The mission of the Wildlife Habitat Connectivity Working Group is focused on promoting the long-term viability of wildlife populations. This mission is directly focused on species, rather than the "coarse filter" approach taken by the Arid Lands Initiative, implemented by selecting systems and species that can be considered an umbrella that captures the needs of many other species. However, the connectivity analysis itself was carried out on a group of species with a broad range of habitat requirements and movement capabilities, as well as on the landscape itself (landscape integrity model). Members of the ALI core team worked closely with the WHCWG to synthesize the individual species' and landscape integrity results into a composite network of the most important areas for maintaining and enhancing wildlife habitat connectivity across the ecoregion. Having this composite network available, combined with the understanding of how the focal species whose networks were included represented the ALI's focal systems and species, allowed the ALI core team to use these products to select priority linkages that would keep our priority core areas connected across the Columbia Plateau.

Identifying the Arid Lands Initiative's shared priority areas

One of the overarching principles guiding the ALI core team's efforts to agree on shared priorities was that the viable, well-connected system or arid lands and related freshwater habitats we envision must be comprised of a network of core areas and functional linkages between them. The analyses described above provided us with the scientific products necessary to map those core areas and linkages. The ALI core team then directed their discussions to how to use these results to select those areas where action should focus on first.

The ALI core team agreed that our coordinated actions should focus first on:

- core patches, with special emphasis on those patches where priority systems and species that are not well represented in currently protected areas in the Columbia Plateau are relatively abundant; and
- linkages between these core patches, particularly those linkages that are critical for keeping the whole ecoregional network connected.

We used the products from the two comprehensive and rigorous bodies of work described above to map these shared priority areas (see *Arid Lands Initiative Shared Priority Areas* box). We currently do not have robust information that would allow us to quantify the relative contributions of core areas versus linkages. The ALI's shared priority areas map, therefore, ranks core areas and linkages separately, with the understanding that:

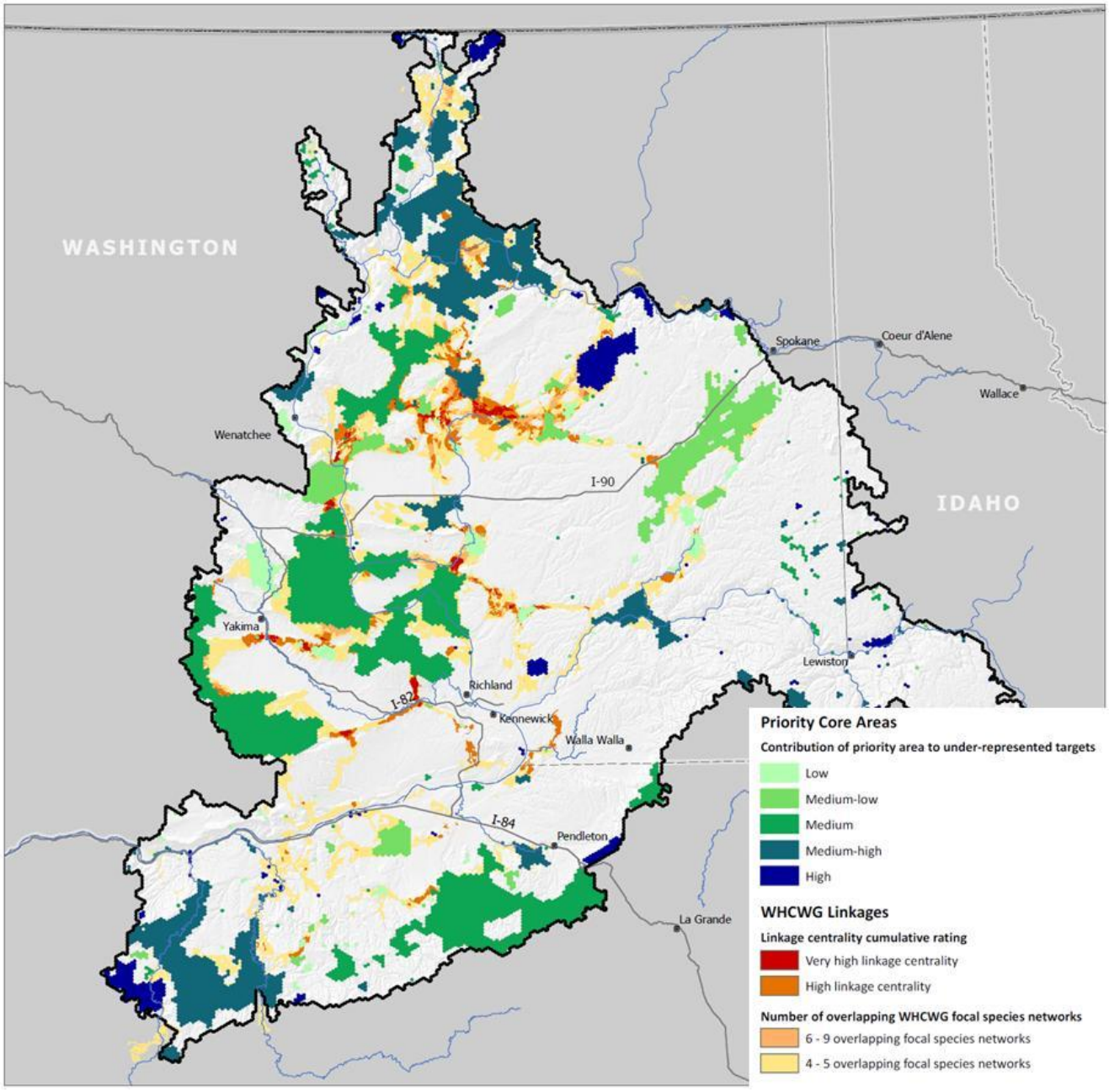
- this approach will provide ALI partners flexibility in identifying where to focus their efforts in ways that contribute to landscape-scale conservation;
- ultimately, priority actions must be implemented in coordination across all core areas and linkages to achieve our shared vision;
- as better information becomes available on the relative contribution of core areas and linkages, the ALI will incorporate this information and refine its priority areas map.

The Arid Lands Initiative Shared Priority Areas

The ALI core team agreed that our coordinated actions should focus first on:

- core patches (in greens and blues), with special emphasis on those patches where priority systems and species that are not well represented in currently protected areas in the Columbia Plateau are relatively abundant; and
- linkages between these core patches (fire colors), particularly those linkages that are critical for keeping the whole ecoregional network connected.

We used the products from the spatial prioritization analysis (ALI 2014) and the Columbia Plateau connectivity analyses (WHCWG 2012, 2013) to these shared priority areas.



Arid Lands Initiative's Shared Priority Areas. The ALI Core Team agreed on the spatial priorities shown in this map. These priority areas were developed based on two scientific analyses developed specifically for the Columbia Plateau ecoregion, with the ALI core team's input and interpretation. These analyses are: *The Spatial Conservation Priorities in the Columbia Plateau Ecoregion – Methods and data used to identify collaborative conservation priority areas for the Arid Lands Initiative*, completed by the Arid Lands Initiative Spatial Methods Team in 2014 (https://www.sciencebase.gov/catalog/folder/52050595e4b0403aa6262c64, accessed March 21, 2014); and *The Washington Connected Landscapes Project: Analysis of the Columbia Plateau Ecoregion*, and two associated analyses, completed by the Washington Habitat Connectivity Working Group in 2012 and 2013 (http://waconnected.org/columbia-plateau-ecoregion, accessed February 24, 2014).

As the ALI partners transition into implementing the strategic priorities, we expect partners will consider these priority areas as they decide on potential projects or actions, their relative contribution towards achieving shared conservation goals and objectives across the ecoregion, and what ALI partners and additional stakeholders to collaborate with. Ultimately, these shared priority areas should help ALI partners coordinate their efforts so that individual projects lead to greater cumulative impact on the health of priority species and systems across the ecoregion. This does not mean that all strategies need to be implemented across all priority areas, nor that every partner works on all strategies in all priority areas. The intent of these shared priority areas – analogous to the intent of the shared priority actions – is to highlight areas that we agree are very important for achieving conservation goals at the ecoregional scale, and to provide a common blueprint around which to coordinate, so each partner can focus on actions and places best aligned with their mandates and resources, collectively contributing to a viable well-connected system of eastern Washington's arid lands and related freshwater habitats.

We expect that by demonstrating success on the ground, the Arid Lands Initiative will be better placed to attract greater resources for actions targeting this landscape-scale vision, and garner greater support from partners, other stakeholders and local communities. In the interest of showing the benefits of such coordination at a landscape scale, and at the same time identifying and improving the mechanisms that facilitate such coordination, the ALI core team selected Douglas County as a Proof-of-Concept Area. Our goal for the Proof-of-Concept Area is to "demonstrate that working together collaboratively, the public and private partners of the Arid Lands Initiative can measurably increase conservation outcomes, reduce regulatory uncertainty to the land manager, and maintain or improve economic viability." The selection of Douglas County was based on this being an area that current ALI partners are already working in (see *Example of Collaborative Projects between Arid Lands Initiative Partners* box), that contains areas that are important for our priority systems and species, and that also provides opportunity for improved coordination at a landscape scale. Explicitly documenting success in terms of the value that the ALI's landscape-scale coordination provides in this Proof-of-Concept Area will be an important part of making progress across other priority areas.

Example of Collaborative Projects between Arid Lands Initiative Partners

The Bureau of Land Management (BLM) and the Washington Dept. of Fish and Wildlife (WDFW) have signed an agreement for collaborative projects in Douglas County, WA. The primary objective of these projects is restoration of shrub-steppe habitat on WDFW and BLM-administered lands in the Upper McCartney Creek Watershed. These projects will increase the amount of nesting, breeding, and foraging habitat in the area, benefiting local, shrub-steppe dependent wildlife. These projects will also promote habitat connectivity across northern Douglas County, an area identified as important for the connectivity networks of multiple Columbia Plateau species.

Under the signed agreement, BLM has supplied funding, native seed, and some equipment. WDFW has supplied equipment, labor, and expertise. So far we have seeded several hundred acres of WDFW- and BLM-managed lands burned in a recent fire. Next steps being planned as part of this cooperative effort include restoring areas dominated by non-native species on WDFW-administered lands (over 35 acres), and similar restoration on adjacent BLM lands (over 15 acres).

Both agencies are active participants in the Arid Lands Initiative (ALI), and these projects are an early example of cooperative work across jurisdictions to implement a coordinated strategy for conservation and restoration, and are occurring within the ALI's Proof-of-Concept Area.

SECTION 4. Looking forward – what the ALI Core Team plans to do

The biological, strategic and spatial priorities articulated in the *Priorities Shared by Arid Lands Initiative Partners* section above comprise three of the four essential elements of a coordinated strategy that the Arid Lands Initiative core team set out to develop for the conservation of eastern Washington arid lands and related

freshwater habitats. This is a first major step towards achieving our shared vision (see *Arid Lands Initiative Coordinating Goal* box).

We are working with partner entities to share the priorities described in this document, as the foundation for each entity to incorporate these spatial priorities and priority actions into their existing management processes, leading to coordinated implementation of conservation actions. These actions will be diverse, ranging from protection and restoration of priority areas, to working with the ranching and farming community to support their efforts to manage productive lands in ways that not only achieve their production objectives but also contribute to the overall functioning of this landscape, to working with entities that regulate and carry out development activities so that communities can benefit while still maintaining and even enhancing the natural beauty and services provided by the surrounding landscape. Achieving this coordinated implementation is not only critical for the sustained ecological function of arid lands and their freshwater habitats, but is also critical to support all of the social and economic values that are built upon that ecological function.

The ALI core team intends to move forward on three fronts:

Implementation: The most important path forward towards realizing our shared vision is to begin implementing relevant shared priority actions in the identified priority areas. We expect these priorities will help guide land-use decisions, and we will track the progress these actions lead to across the landscape. This will allow the ALI to compile clear information regarding the success of current efforts in achieving landscape-level goals, where these efforts may be falling short, and the lessons learned in the process that can inform where and how we can improve.

Coordination: Each partner and collaborative organization or individual is constantly adjusting to internally and externally driven changes. In such a dynamic context, maintaining the level of trust and agreement, coordination and cooperation achieved by the ALI core team while we defined shared priorities will require investment in effective and efficient communications, flexibility, and shared support among partners. We believe this can be achieved efficiently given:

- clear agreement on the roles each partner will play in implementing these shared priorities;
- an appropriate governance structure that brings the right people together to communicate their entity's perspective, make decisions on the most relevant issues, and then communicate these decisions back within their agency or organization in effective ways; and
- shared investment to support a coordinator tasked with maintaining and facilitating these conversations, and supporting individual partners' communications, coordination, implementation, and monitoring actions, to facilitate their effectiveness.

In addition, this coordination and the coordinator's work will continue to facilitate communications of the ALI's purpose, actions and successes to stakeholders and other partnerships with overlapping interests, from local land trusts such as the Okanogan Land Trust[12], to broad scale collaborative groups such as the Great Northern Landscape Conservation Cooperative[13], or with partnerships developing other science products and tools, such

[12] http://www.okanoganlandtrust.org/
[13] http://greatnorthernlcc.org/

as the Wildlife Habitat Connectivity Working Group[14] and the Western Governors' Association's Critical Habitat Assessment Tool[15].

Continuing research: The ALI core team is committed to promoting the use of best available science to inform its partners' landscape conservation efforts. We recognize that there is an array of information that would help the ALI (a) refine and improve its priorities, and (b) effectively adjust our actions, and potentially our goals and priorities, to make the most progress towards our shared vision (see *Research Needs* box). As stated above, we believe implementation is critical, even as we recognize that we are currently acting on incomplete knowledge. Our recommended approach, therefore, is to invest early in implementation, and to monitor key indicators to discern if each strategy is effectively achieving the short- and long-term results we expected, while encouraging and supporting additional scientific analyses that are still needed to guide our decisions. In this way, coordinated action is not impeded by incomplete knowledge, and uncertainty is clearly recognized and addressed, allowing us to close the adaptive loop between on-going science endeavors and the management actions that the science informs.

The Arid Lands Initiative is currently supporting two analyses that will help both refine our priorities, and quantify the baseline against which we can monitor progress. These projects arose from gaps the ALI core team recognized in our collective knowledge, and are focused on determining:

- *Will conservation of our priority areas allow us to achieve our goals?* Through a rapid assessment of the condition of our focal systems in our priority areas, we will be able to quantify how far we currently are from our stated goals.

Research Needs

Research needs to refine and improve priorities include:

- *Will our network of linked core areas be robust under a changing climate, and continue to function as a viable well-connected system in the future?* We need to evaluate the resilience and robustness of priority areas to climate change and its interaction with other changes, and adjust our network of priority areas to give species and systems the greatest opportunity to adapt to climate change.
- *Which are the most important areas to ensure that Riverine Systems across the Columbia Plateau provide the habitat, goods and services we value from them?* We need to identify and incorporate our riverine priorities more effectively, and adjust the ALI priority areas to reflect areas critical for the freshwater habitats contained within this arid landscape.
- *Are our assumptions valid? Will this coordinated strategy lead to a viable, well-connected system of arid lands and related freshwater habitats?* We need to quantify what the conservation of our priority areas will achieve in terms of the viability of wildlife and plant populations and communities we care about, and adjust the ALI's goals and priorities to ensure we can achieve our shared vision, now and under a changing climate.

Research needs to track progress and effectively adjust coordinated action include:

- *Implementation and effectiveness monitoring:* We need to monitor indicators that show whether our coordinated implementation is achieving the results we expect, evaluate where they are not doing so, and adjust our priorities, partners, and actions as appropriate to keep our strategies effective and on track towards our shared vision.
- *Status and trends monitoring:* We need to monitor key indicators of the status of our priority systems and species, evaluate change in these indicators as strategies are implemented and as other socio-economic and environmental factors change, and adjust our actions, and potentially our goals and priorities, to ensure progress is effectively and efficiently being made towards our shared vision.

[14] http://waconnected.org/
[15] http://www.westgov.org/initiatives/wildlife

- *Will the network of priority areas be robust to a changing climate?* Through explicitly exploring projections of how the climate may change across the Columbia Plateau and surrounding ecoregions, we will be able to quantify the impact on our priorities, and guide adjustments in our network of priority areas to improve their likelihood of persisting into the future, thereby allowing our focal species and systems the chance to shift and adapt to the changing climate.

The ALI is also pursuing funding to incorporate these shared priorities into partners' planning processes and work plans, coordinate actions on the ground, and filling in gaps in our knowledge on important areas for riverine systems across the ecoregion. Such funding will allow us to transition quickly into coordinated implementation of priority actions, while ensuring we have a comprehensive understanding of current conditions against which to compare changes and track progress towards our shared goals.

SECTION 5. Conclusion

The intent of this document is to articulate the Arid Lands Initiative core team's shared agreement on what species, systems and areas contribute most highly to a viable, well-connected network across the Columbia Plateau, now and into the future, and what actions must be implemented and coordinated at this landscape scale to conserve them. This is a starting point for achieving the ALI's shared vision, which not only includes the needs of these species and systems, but also of the people and communities that live, work, manage and depend on them.

Not all of the priority actions need to be implemented everywhere, nor with the involvement of all partners. ALI partner entities have their own mandates, goals and priorities, as well as their own dynamic planning processes, and implementation starts with agreeing on which entity is best placed to focus on the different shared priorities articulated in this document. How the shared priority actions are implemented also depends on the on-the-ground managers, partners and stakeholders with interests and other objectives for each area. As we learn through implementing projects in a coordinated fashion, actions may need to be adapted to be successful. We expect this document to provide a landscape-scale view and a perspective on priorities each partner shares with others working in eastern Washington that will center and focus our conservation actions. Folding these priorities into each partners' plans, coordinating their implementation on-the-ground, and constantly learning from our actions and new scientific endeavors is how we expect to achieve success across this beautiful, complex landscape we call eastern Washington's arid lands.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